

P7 3019
102

UNIVERSITY OF TORONTO



REPORT OF THE DEAN
OF THE
FACULTY OF MEDICINE

SESSION 1942-1943

PRINTED IN CANADA
THE UNIVERSITY OF TORONTO PRESS

UNIVERSITY OF TORONTO

FACULTY OF MEDICINE

Toronto, June 30th, 1943

*To the Graduates in Medicine of
the University of Toronto.*

The Annual Report of the Dean of the Faculty is sent each year to all the graduates in Medicine in order that their interest in the School may be maintained and that they may have accurate information upon which to base comment and helpful criticism. With this Report go the best wishes of the Faculty.

W. E. GALLIE,
Dean.

REPORT OF THE DEAN OF THE FACULTY OF MEDICINE

As the war moves on to the close of its fourth year, it becomes increasingly evident that the decision to discourage the enlistment of our students until graduation, was the wise one. The demand for medical officers appears to be as urgent today as it was after the first twelve months of war, and now the source of supply has narrowed until it is almost solely from the medical schools. This school may well be proud that since the declaration of war it has contributed to the medical corps of the Army, the Navy, and the Air Force more than 500 officers and by the end of 1943 will have added more than 100 more.

This contribution has been possible only because of the devotion of the staff. The strain of almost continuous teaching and hospital service has had its effect, but in spite of this the work has been done and done exceedingly well. Many of the members of the staff, however, are beginning to look forward to the day when a holiday can be taken.

The effect of the acceleration of the course on the students has been watched with much interest. At first thought one might suppose that the crowding of the work of six years into approximately four and a half would lead to a deterioration of the product. This has not been very evident, however, and we think that the increased enthusiasm of the students, faced as they are with the opportunity for service, has made up for the extra heavy curriculum and the absence of almost all the best young teachers. So little has been the deterioration indeed, that the Faculty has decided to give consideration to a plan to reduce permanently the present six-year course to a course of five years—by the simple process of shortening the holidays. Under present peace-time arrangements the students have completed their university work by May 10 and do not return till about September 25, a holiday of approximately four and a half months. This is an unreasonable waste of time when consideration is given to the length of internship that is now thought necessary for practice. This long summer holiday was handed down from the days when a high proportion of the students came from the farms and were urgently needed at home during the summer months. A survey of the students at the present time, however, shows that very few come from the farms and that the large majority of those who must earn some money during the summer do so between June 15 and September 1, the period during which summer hotels and steamships are active. It may be possible, therefore, if the curriculum can be arranged without actually shortening the number of weeks of attendance at the University, or otherwise injuring the course, to lengthen each academic year by six or seven weeks and so bring the student to graduation at the end of five instead of six years. This proposal is now in the hands of a committee of the Faculty and will be reported upon soon.

This year the various committees of the Faculty and indeed, the Faculty Council itself, have been called upon for more continuous work than in the memory of the members. The chief reason for this has been the call of the Canadian Medical Association and the Government for advice in the drafting of the proposed Health Insurance Act. This necessitated many meetings of the special committees and of the Faculty, and several conferences in Ottawa with the committee of the Canadian Medical Association and with the deans of the other medical schools. As a result of these deliberations a memorandum was drafted and presented to the committee in charge of the Bill and it is hoped that it will be of value in safeguarding the interests of medical education, should the proposed changes in medical practice be made. The chief concern of the

Faculty is that if and when the proposed reform of medical service takes place, there shall be no let-down in the quality of clinical teaching and that out of the changes there shall come a general improvement in medical education. It is the general consensus that with the adoption of any broad medical Act there will be a call for specialists of all kinds. If the general principle is adopted, as appears to be likely in Great Britain, that all the people shall have available, not a minimum medical service but the best possible medical service, it will mean an enormous expansion all over the country and a tremendous strain on the medical schools. It has been of the greatest concern to the Faculty, therefore, that guidance should be given to the drafters of the Bill in making sure the supply of clinical material shall be adequate, that control of policy in treatment and in teaching shall be maintained, that there shall be increased facilities for the training of specialists, and that there shall be ample support for medical research.

Out of the conferences of the medical schools has come the organization of an Association of Canadian Medical Schools which will meet each year, at the time of the annual meeting of the Medical Council of Canada. It is hoped that this will greatly accelerate inter-university discussion and consultation and advance the interests of medical education.

Keeping abreast of the times the curriculum has been modified this year to include a course of six lectures in Social Medicine to be delivered by Professor S. K. Jaffary. These lectures will cover a discussion of Canadian population and its tendency to change, the case of social security, social insurance, workmen's compensation, and the whole subject of health insurance. It was felt that our students should have a thorough understanding of the principles involved.

This year too, a course leading to a Diploma in Industrial Hygiene was introduced for graduates of this or other universities. It is designed to provide instruction for physicians serving in governmental departments interested in industrial hygiene and also in industry. It is a very comprehensive course, somewhat similar to that leading to the D.P.H., but it includes instruction in industrial medicine and surgery and provides a field course in various large industrial plants.

An important change is to be made in the requirements for admission in that henceforth Physics and Chemistry will be required subjects, whereas in the past any two of Botany, Chemistry, Physics, Zoology were acceptable. The change was made necessary because the scientific departments found that students who entered without instruction in Chemistry and Physics were much handicapped throughout the whole first year and held back those members of the class who had had previous instruction.

The Faculty was glad to be able to assist the three Medical Services with special graduate courses suited to the requirements of each. In January an intensive course was given to fourteen medical officers from the Navy by the Departments of Medicine, Surgery, and Physiology. Later the Department of Medicine gave a three months' course to six medical officers from the Army and throughout the year has combined with the Department of Psychiatry in training groups of officers detailed for instruction in Neurology and Psychiatry. The Department of Radiology in spite of the depletion of its staff has given course after course of instruction to officers and technicians. In addition to these planned courses we have had a succession of officers sent to us for training in specialties, such as Thoracic, Orthopaedic, and Neurosurgery, in order that their general surgical knowledge might be enlarged to suit the exigencies of war. Such officers have been attached to one of the services at the General Hospital and have joined in the routine work. Three intensive courses on the technique of using the Stader splint have been given by the Departments of Surgery and Anatomy.

Your attention is directed to that part of the report of the Department of Surgery which refers to the temporary solution of the complete disruption

of postgraduate training in Surgery which resulted from the plan of enlisting all graduates after a rotating internship. The Medical Services soon realized that the cessation of a supply of young surgeons would ultimately be serious and have now arranged to second officers who have shown aptitude, to the teaching hospitals, for abbreviated periods as Residents and Assistant Residents. These six-month periods, when supported by further training in military hospitals, will keep up the supply of trained officer personnel and provide a pool for civilian needs when the war is over.

Research continues in spite of the disorganization of the staff and is largely directed to the solution of problems rising out of the war. The close association of the National Research Council with the studies going on in all our departments has been a most valuable influence.

The financial difficulties of the students arising out of the acceleration of the course have been solved. The enlistment of the two final years as private soldiers with the usual pay and sustenance allowance, and the arrangement whereby loans from the Department of Labour and from the Kellogg Fund were available for students in the other years, overcame all our difficulties. It is gratifying to be able to report that the Department of Labour has announced that for those students who received assistance from the Dominion fund in 1942-3 and who were successful in the annual examinations, half of any further assistance given will be in the form of an outright grant and the remainder as a loan on the same terms as the previous year.

The King's birthday honours list included several members of the faculty. Lieutenant-Colonel J. C. Richardson, Officer in charge of Medicine, No. 1 Neurological Hospital, and Major A. C. Singleton were made Members of the Order of the British Empire. Professor E. F. Burton and Professor R. D. Defries received the O.B.E.

Professor N. S. Shenstone and Colonel J. A. MacFarlane, Consultant in Surgery in the Army Overseas, were made honorary fellows of the Royal College of Surgeons of England.

Professor Best who is Surgeon Captain in the Royal Canadian Navy was appointed to the chairmanship of the Scientific Directors of the International Health Division of the Rockefeller Foundation, succeeding Surgeon General Parran. Professor A. M. Wynne was elected a Fellow of the Royal Society of Canada.

A nice compliment was paid to Professor F. F. Tisdall, Department of Paediatrics of the Faculty and the Hospital for Sick Children, by the Medical School Hospitals Centre in Birmingham, England, in inviting him to deliver the Ingleby Lectures in the summer of 1943. Unfortunately he could not be in England on the dates proposed.

The acceleration of the course has made it necessary to hold special convocations at irregular intervals for the graduation of our students. One was held on January 28, 1943, and another on July 30, 1943. Both these convocations were made very impressive by the khaki of the students. An innovation was introduced in the form of an address to the graduates. Brigadier G. B. Chisholm, Director General of the Medical Services, gave the address in January and Surgeon Captain A. McCallum in July. These addresses added greatly to the occasion and will be continued as long as Medicine has a separate convocation. The Faculty has been so impressed, indeed, with the success of these private convocations that there may be a desire to continue them after the war.

The special lectures delivered this year in Convocation Hall were *the Balfour Lecture by Dr. Jas. C. Masson of Rochester, Minnesota, and the Banting Memorial Lecture by Dr. Elliott P. Joslin of Boston. Dr. Masson spoke on "Ovarian Tumour" and Dr. Joslin on diabetes, with which disease no man has had greater experience.

*Copies available in the Medical Office on application.

Since the last annual report two young members of the staff have given their lives for their country. In September, 1942, Surgeon Lieutenant George A. Hendry, a member of the Department of Gynaecology and Obstetrics, was lost at sea while serving as medical officer of H.M.C.S. *Ottawa*, torpedoed in battle. The despatches reporting the action cited him officially for devotion to duty. On November 8, during the landing of the British and American troops at Oran, Surgeon Lieutenant Jacques Bourgeois, a Fellow in Surgery, went down with his ship, H.M.S. *Hartland*, in the very moment of victory. These young men will be remembered as ideal young Canadians and the memorial services that were held for them in Toronto and Montreal showed the high regard in which they were held.

It is my sad duty to record the deaths of two former members of the staff, Dr. D. King Smith and Dr. H. C. Parsons, and two members of the active staff, Dr. Jabez Elliott and Dr. L. J. Sebert.

In December, 1942, the President presented to the University a sum of money the income from which is to be used to provide one gold medal and two silver medals in the Faculty of Medicine. The first Cody gold medals were presented by the President at the convocation on January 28, 1943 to Dr. J. G. Mickler and Dr. W. Wise.

The Faculty is indebted to the Medical Alumni Association for a scholarship of \$200 to be awarded each year to a first-year student on the basis of his standing in the grade XIII examination, proficiency in Science and Mathematics, his record in participation in student activities, and his actual financial needs. This is the only freshman scholarship and it is hoped that the example of the Alumni Association will lead others to found similar scholarships for deserving students.

The special thanks of the Faculty are due to Dr. E. S. Ryerson who is largely responsible for the successful planning and operation of the accelerated course in this and the other Canadian universities.

W. E. GALLIE

MEDALS, PRIZES, FELLOWSHIPS, SCHOLARSHIPS AND BURSARIES

Awarded at Convocation, January, 1943

The Cody Gold Medal.....	C. G. Stewart
The Cody Silver Medal.....	J. P. G. Maroosis
The Cody Silver Medal.....	Miss W. G. Allison
The Chappell Prize in Clinical Surgery.....	L. H. Douglas
The William John Hendry Memorial Scholarship in Obstetrics and Gynaecology.....	W. S. Sedgwick
The Ontario Medical Association Prize in Preventive Medicine.....	W. S. Sedgwick
The David Dunlap Memorial Scholarships:	
Sixth Year.....	D. B. McKee
Fifth Year.....	Miss M. J. Forgie
The R. S. Saddington Medal in Pathology.....	G. W. Smith
The B'nai B'rith Scholarship.....	H. Kalant

Awarded at Convocation in April, 1943

The Cody Gold Medal.....	A. S. Tauber
The Cody Silver Medal.....	H. A. W. Smith
The Cody Silver Medal.....	E. F. Routley
The Chappell Prize in Clinical Medicine.....	E. F. Routley
The William John Hendry Memorial Scholarship in Obstetrics and Gynaecology.....	D. M. Boyd and Miss M. J. Forgie (aeq.)
The Ontario Medical Association Prize in Preventive Medicine.....	E. F. Routley
The David Dunlap Memorial Scholarships:	
Sixth Year.....	J. E. Harvey
Fifth Year.....	W. B. Spaulding
The R. S. Saddington Medal in Pathology.....	J. V. Basmajian

Awarded at other periods

The Baptie Scholarship.....	M. Kitchener
The B'nai B'rith Scholarship.....	W. T. W. Clarke
The Lister Prize in Surgery.....	W. S. Anderson, B.Sc.(Alta.), M.D.
The Faulkner Medal in Psychiatry.....	J. D. Scott, M.D., C.M.
The Faulkner Medal in Psychiatry.....	M. Straker, M.D., C.M.

REGISTRATION OF STUDENTS IN THE FACULTY OF MEDICINE

SESSION 1943-1944

• First year.....	150
Second year.....	126
Third year.....	138
Fourth year (not till January).	
Fifth year.....	117
Sixth year.....	127
• Diploma in Public Health.....	19
Diploma in Radiology.....	2
Diploma in Psychiatry.....	2
Occasional Students.....	3
	<hr/>
	684

ANATOMY

Under the direction of Professor J. C. B. Grant

No reduction in the number of students receiving instruction in Anatomy has been brought about by the war. Last year the Department gave instruction to 596 students in all. Of these, 283 were in the Faculty of Medicine and 80 in the Faculty of Dentistry; 76 were taking the course in Physiotherapy, 76 in Occupational Therapy, 17 in Graduate Nursing, 44 in Physical and Health Education, and 20 in Optometry. The courses in Anatomy to students of Medicine, Physiotherapy, Occupational Therapy, and Physical and Health Education extend over a period of two years. Thus, teaching in the Department is almost continuous throughout the day, several classes being conducted concurrently.

During the winter, the Head of the Department gave a series of Wednesday evening lectures on Anatomy to officers and men of the R.C.A.F. who are training to be instructors in Physical Culture.

Professor J. C. Watt has given two courses of lecture-demonstrations to members of the class of Medical Radiologists for Military Service, one during the winter and one during the spring.

Professor C. G. Smith, who has been responsible for the teaching of Neuro-Anatomy, obtained a commission in the R.C.N.V.R. and is conducting valuable investigational work for the Navy. The two demonstrators in this subject, Drs. G. A. Graham and B. Wintrob, have likewise obtained commissions with the Forces. Their duties have been assumed by the remaining members of the staff. Of the five technicians and laboratory attendants concerned with Gross Anatomy, four are now with the forces, namely, Lieutenant-Colonel H. LeMasurier, Major B. L. Guyatt, Private C. E. Storton, A.C.2. R. Wilcox.

Despite the increase in the number of students and the decrease in the staff, all lectures, demonstrations, and tutorials have been conducted as in previous years. The students, however, are feeling the great pressure of the accelerated course.

Professor A. W. Ham, with Miss Salter of the Department of Psychology, has published an interesting and instructive book—*Doctor in the Making*—which has been enthusiastically received and which it is felt will be of great assistance in helping many over their various difficulties.

RESEARCHES

Dr. Ham and Dr. Baldwin have collaborated with Dr. G. W. Lucas of the Department of Pharmacology in investigating the toxicity of several explosives. This work has been assisted by a grant from the National Research Council and the results of these investigations have been reported to it.

In collaboration with Dr. H. K. Box of the Faculty of Dentistry, Dr. Ham has made a study of the histopathology of Necrotic Gingivitis (Trench Mouth) and has assisted in outlining a new method of treatment.

The tannic acid treatment of burns has recently come under review and Dr. Ham has made studies to determine the amount of the acid that must be absorbed to cause damage to the liver. The toxicity of alternative tanning agents is being investigated as is also the actions of tanning agents applied to a burn site. This investigation is being assisted by a grant from the National Research Council.

During the year considerable assistance in preparing and reviewing sections in connection with research work carried on in other departments has been given by this department.

All our research activities have been facilitated by the skilled technical help of H. Whittaker and G. Ross.

Dr. H. C. Elliott, working on a grant from the National Research Council of the United States, has been studying a large series of spinal cords from acute and chronic cases of poliomyelitis with special reference to the distribution of the lesions among the motor nuclei.

PUBLICATIONS

ELLIOTT, H. C. "Studies on the motor cells of the spinal cord. II Distribution in the normal human foetal cord" (*American Journal of Anatomy*, vol. 72, Jan. 15, 1943, pp. 29, 38).

HAM, A. W. with Box, H. K. "Necrotic gingivitis: Its histopathology and treatment with an adherent dressing" (*Oral Health*, vol. 32, Dec., 1942, pp. 721-36); reprinted by the Canadian Dental Research Foundation, *Bulletin* no. 25; reprinted, slightly abbreviated, in *Dentistry*, vol. 3, May, 1943, pp. 569-74).

————— and SALTER, M. D. *Doctor in the making*. Philadelphia: Lippincott and Co. 1943.

SMITH, C. G. "Age incidence of atrophy of olfactory nerves in man" (*Journal of Comparative Neurology*, vol. 77, Dec., 1943, pp. 589-94).

BIOCHEMISTRY

Under the direction of Professor H. Wasteneys

The academic work of the department, adapted to the exigencies of war conditions, was carried out on precisely the same lines as during last year.

The research time of staff and graduate students has been almost entirely spent in investigations on behalf of the Department of National Defence. Such academic research as it was found possible to continue has been separately reported to the President.

The two Sino-British Fund Students of the department, Messrs. Chang and Shen, completed the requirements for the Ph.D. degree. Three students, Messrs. Zbarsky, Laughland, and Young completed the requirements for the M.A. degree. All these degrees have since been conferred.

The total number of students registered in the department during the session 1942-3 was 414. This number was made up of 262 Medical students, 10 students of the General course, 6 P. & B., 2 Biology, 39 Household Economics, 12 Household Science, 62 Dentistry, and 21 Graduates. Of the graduate students 6 were candidates for the Ph.D., 5 for the M.A., 1 for the M.S.A., and 1 Occasional student. Seven were taking Biochemistry as a minor for degrees in other departments and 11 were taking their major work in Biochemistry.

RESEARCHES

The staff of the department and the graduate students working under their direction have occupied the whole, or a major portion of their research time, in work for the Department of National Defence. These researches may not, of course, be reported. Nevertheless, while most of the academic research has been suspended, some investigations have been continued.

Dr. J. M. Fisher has continued, in collaboration with Dr. R. Haist of the Department of Physiology, the investigation of chemical changes occurring in shock. This involved analyses of electrolytes in the tissues and in the blood of dogs in which shock had been produced by occluding the blood supply from the hind limbs.

The study of the effect of salts on the hardening and water intake of fish eggs, previously undertaken, was extended in collaboration with Dr. K. C. Fisher of the Department of Biology. It was found (1) that magnesium ions will not replace calcium ions in producing the hardening of the outer egg membrane, (2) that the hardness produced by calcium was not reversed by citrate unless the egg contents coagulated, and (3) that a trace of citrate in the perfusion fluid caused a less resistant membrane than double-distilled water perfused through a pyrex glass apparatus. These results are significant in the clarification of the fundamental factors concerned with the preservation of the integrity of the cell.

Under the direction of Professor A. M. Wynne

Miss M. A. Emmett has investigated the kinetics of reactions catalysed by intestinal phosphatase, with special attention to the relation between pH and the concentration of substrate.

Mr. W. D. Graham has made a study of the fermentation of different varieties of western Canadian Wheat by *Clostridium acetobutylicum* with a view to determining their suitability as raw material for the commercial production of acetone and butyl alcohol. The material for this investigation was supplied by Dr. J. G. Davidson of the Experimental Farm at Indian Head, Saskatchewan.

Mr. I. Motzok of the Department of Animal Nutrition, Ontario Agricultural College, has investigated the properties and activity of the plasma phosphatase of chicks and has made a quantitative study of the correlation between the amount of plasma phosphatase and the severity of rickets in chicks.

Mr. C. W. Shen, Sino-British Indemnity Fund Fellow, in completing his work for the degree of Ph.D., has continued his studies of the formation and activity of yeast phosphatase.

Mr. J. F. Morgan and Mr. Graham have been engaged in an investigation sponsored by the Department of National Defence in Ottawa.

Under the direction of Professor L. Young

Researches on the metabolism of carcinogenic and non-carcinogenic polycyclic hydrocarbons (with Dr. L. H. Chang), the chemistry and biochemistry of mercapturic acids (with Mr. S. H. Zbarsky), and the excretion of monoaryl sulphates (with Mr. D. H. Laughland) were suspended during the year.

Work on a project conducted since 1940 by Professor Young on behalf of the Department of National Defence has been continued and has been the subject of various reports to the appropriate authorities. Associated with Professor Young in this work during the past year were: Mr. J. A. McCarter, Mr. M. Edson, Mr. S. H. Zbarsky, Mr. D. H. Laughland, Mr. S. D. Simpson, Mr. S. J. Patrick, Miss G. E. Brackenbury, and Miss E. Estok.

PUBLICATIONS

BARTON, A. D., and YOUNG, L. "p-Toluidine salts of monoaryl sulfates" (*Journal of the American Chemical Society*, vol. 65, 1943, p. 294).

MANERY, J. F., and SOLANDT, D. Y. "Studies in experimental traumatic shock with particular reference to plasma potassium changes" (*American Journal of Physiology*, vol. 138, no. 3, 1943, pp. 499-511).

HYGIENE AND PREVENTIVE MEDICINE

Under the direction of Professor D. T. Fraser

The enrolment of graduate students in the course for the Diploma in Public Health for the session 1942-3 numbered 19 as compared with 24 in 1941. The following provinces were represented: Nova Scotia, 1; Quebec, 9; Ontario, 6; British Columbia, 1. One student was from British Guinea and one from Jamaica. Five students were Rockefeller Foundation fellows and one was a Connaught Laboratories fellow. Including the students of this year, the total number enrolled since 1911 is 271.

As previously, courses of instruction in Bacteriology, Immunology, and Parasitology were given to these students in the course leading to the Diploma in Public Health and also to suitable qualified graduate students. At the present time there is urgent need for men in Preventive Medicine and Public Health in Canada, both for civilian duties and with the armed forces. Of the classes graduating from the University of Toronto with the Diploma in Public Health, in the last ten years, 22 have joined the armed forces.

During the session the field course was held from March 30 to April 11. It is a pleasure to acknowledge the full co-operation of the Department of Health of Ontario and the Department of Public Health, Toronto, in allowing the members of their staff to assume this added burden.

Laboratory courses and lectures were given as usual to the students in the second year in Pharmacy, second and third year Household Science and Household Economics, and to students in the School of Nursing.

Dr. Ronald Hare has published his method of concentrating influenza A virus from allantoic fluid. Vaccine in quantity has been produced and used in human volunteers across the Dominion, comprising medical students at the University of Toronto, volunteers on the staff of the Department of Health, Manitoba; students at the University of Alberta and the University of British Columbia. Half of these persons served as controls, receiving injections of saline in place of the vaccine. Physicians were appointed to assess the clinical condition of the groups in the event of respiratory infections developing. An epidemic of influenza A was expected in the early part of 1943. An epidemic of rather mild and atypical character appeared, first in Toronto and spreading westward, affected all the centres in turn. The etiological agent was not A and hence no data bearing directly upon the efficacy of the vaccine were obtained. However, other valuable data were gathered which amply justified the undertaking. At the instance of Dr. Duncan Graham, Dr. Hare continued his study of influenza and similar infections with the co-operation of officers of the armed forces, in particular, Major J. Hamilton, Squadron Leader J. Meakins, Surgeon Lieutenant Elliot and Major Feasby. Approximately 30 per cent of the cases were probably due to influenza B virus, the etiology of the remainder not being determined.

Dr. F. Fraser, in co-operation with Dr. P. J. Moloney, has prepared a combined antigen containing diphtheria toxoid, tetanus toxoid, and tannic acid precipitate (Veldee) of scarlet fever toxin. In co-operation with Dr. A. L. MacNabb and Squadron Leader Young and others, a large number of strains of haemolytic streptococci isolated from personnel of the R.C.A.F. were grouped and typed. The incidence of carriers of group A was approximately 20 per cent.

Apart from cases of scarlet fever, the types isolated from patients suffering from respiratory infections were the same as those from carriers. In contrast, only two types were isolated from cases of scarlet fever, type 3 and type 17. In the previous year, of 33 cases of scarlet fever at this station, 32 belonged to these two types.

Dr. H. Plummer has been exploring the problem of toxoid from *B. botulinus*, A and B. Dr. F. O. Wishart has carried out a series of experiments on the anti-toxin response in humans to various alum precipitated diphtheria toxoids. A comprehensive study in co-operation with medical personnel of the armed forces has been carried out by members of the department of the antitoxin response to typhoid vaccine combined with tetanus toxoid. The results of these studies are in press.

Dr. P. J. Moloney with Miss J. Hennessy has made progress in the "in vitro" testing of various toxins, particularly those of *Cl. tetani* and certain members of the gas gangrene group. Dr. E. Taylor has been successful in exploring the factors concerned in the production of other toxins.

PUBLICATIONS

- FRASER, D. T., MACLEAN, D. L., ORR, M. D., PLUMMER, H. C., and WISHART, F. O. "Tetanus toxoid and its use for active immunization" (*Canadian Public Health Journal*, Sept., 1943; *American Journal of Public Health*, Sept., 1943).
- HARE, R., MCCLELLAND, L., and MORGAN, J. "A Method for the concentration of influenza virus" (*Canadian Public Health Journal*, July, 1942).
- HORNER, C. M., WISHART, F. O., and WATERS, G. G. "The antitoxin response to diphtheria toxoid of low alum content" (*Canadian Public Health Journal*, Sept., 1943).

MEDICAL JURISPRUDENCE

Under the direction of Dr. K. G. Gray and Professor W. L. Robinson

The course in Medical Jurisprudence has been continued much the same as last year. Dr. Smirle Lawson, Supervising Coroner for the Province of Ontario, whose wide experience as a Coroner allows him to speak with some authority on such subjects as the procedure of Coroner's Courts and the practical work connected thereto, has continued his lectures as in previous years, including lectures on Infanticide, Rape, Abortions, etc.

The lectures on the legal aspects of medicine have been presented in a very acceptable manner by Professor F. C. Auld of the Law School of this University, and Mr. Cecil Snyder, Deputy Attorney-General of the Province of Ontario. Professor Joslyn Rogers also assisted us this year with a lecture on crime detection. The lectures on Medico-legal Pathology, as in the past, have been carried on by Dr. W. L. Robinson.

This course has always been well received by the students and, from the interest shown and the extent of the field to be covered, we think we could use to very good advantage an increase in the number of lecture periods allowed us.

During this last year we have been able to assist the Attorney-General's Department in the organization of the pathologists of the province into a group of key men who will be called upon by them in all cases of major crime. A number of consultants have been appointed in the various fields of medicine and law to support this organization. This obviates the necessity for the sending out of experts from Toronto to handle the pathological side of crime situations in the outlying districts. So far it has worked out very well indeed for all concerned.

MEDICINE

Under the direction of Professor Duncan Graham

For the second year of the accelerated course, the Department of Medicine has carried through its regular programme of teaching but it is becoming evident

that the accelerated course is proving a hardship to both students and teachers. Once again special emphasis was given to medical problems presented by the war. This included the diagnosis and treatment of war neurosis.

In addition to the undergraduate course, the department has given courses to medical officers in the armed forces and has taken part in a short course for physicians and surgeons in Industrial Medicine. A month's course for medical officers of the Navy was given in January. At the request of the Director General of Medical Services the department is giving a special course in Neurology and Psychological Medicine for three medical officers every two months, and also a three months' course covering the field of Internal Medicine for six medical officers. A number of Medical Officers, many of them former internes, have visited the department for short periods and attended clinics and ward rounds.

The department records with regret the passing during the year of two former members of the staff, Dr. D. King Smith and Dr. H. C. Parsons, and a member of the active staff, Dr. Jabez Elliott. All had rendered long and faithful service to the department. Dr. D. King Smith will be remembered as a distinguished dermatologist and Drs. Parsons and Jabez Elliott as international leaders in the fight against tuberculosis.

Thirteen members of the active staff and nine former fellows in Medicine are now on active service. Last autumn Lieutenant-Colonel H. H. Hyland, Officer-in-Charge of the Medical Division of No. 1 Neurological Hospital, was recalled from Overseas at the request of the University in order that Dr. J. A. Walters, a junior member of the Staff, might enlist. Overseas Colonel Hyland was succeeded by his first Assistant, Major, now Lieutenant-Colonel, J. C. Richardson. During the year the following members of the Staff enlisted for active service with the Royal Canadian Army Medical Corps: Drs. R. A. Clegghorn, A. E. Parks, J. A. Walters, and N. M. Wrong, and N. W. Simmons, B.Sc., Research Assistant in Medicine.

In September the Head of the department resigned his part-time appointment as Chief Consultant in Medicine for the Army and has been succeeded in this post, which is now a full-time appointment, by a member of the department on active service, Colonel W. P. Warner. He continues to serve as a member of the National Research Council and Chairman of its Associate Committee on Aviation Medical Research and Subcommittee on Infection of the Associate Committee on Medical Research. Recently he was appointed a Member of the newly created Associate Committee on Army Medical Research. The Chairman of this Committee is Lieutenant-Colonel W. Hurst Brown. Surgeon Lieutenant-Commander J. W. Graham is acting as Consultant in Medicine for the Navy at Halifax.

The department is pleased to report that the name of Lieutenant-Colonel J. C. Richardson was among those mentioned in the King's Birthday Honour List. He was made an M.B.E. A former senior interne in Medicine at the Toronto General Hospital, Squadron Officer Jean Davey, Senior Medical Officer in the Women's Division of the R.C.A.F., was made an O.B.E. Another former senior interne in Medicine, Dr. Alan Graham, who was serving as a medical officer with the R.A.M.C. at Tobruk, was awarded the Military Cross. Dr. Graham is now a prisoner of war.

RESEARCHES

For the past three years Dr. Clegghorn has been investigating the mechanism of "shock" and its treatment. With the part-time assistance of J. B. Armstrong and A. D. McKelvey, the effect of environmental temperature on dogs in shock produced by haemorrhage according to a standardized method was studied. It was found that an environmental temperature of 52° F. caused a slight increase in mortality compared to the controls kept at 72° F. At 85° the mortality was

three times that in the controls and at 100° the mortality was 100 per cent within twenty-four hours of bleeding. These results have an important bearing on the use of heat in the treatment of haemorrhage and shock.

Shock in dogs was also produced by trauma administered by a standardized method and a study made of the pulse rate, blood pressure, blood sugar, and haematocrit in different stages of shock. It was found that in dogs suffering from severe shock due to trauma, dog serum or isinglass prolonged life but ultimately all died. Survival of the shocked dogs only occurred when dog serum or isinglass was administered before a profound or prolonged fall of blood pressure had taken place.

For several years Dr. W. R. Campbell has made a careful study of the dangerous effects of an excess of thyroxin in the body, which occurs in certain diseases of the thyroid common in Ontario. A paper on "Thyrotoxicosis and its Treatment," based on this study, has been published.

To meet the need for a rapid, accurate method of measuring the specific gravity of small amounts of fluid, Dr. Campbell has devised a suitable electromagnetic method.

In this war all men enlisting in the Canadian Army must have an x-ray of the chest for the detection of tuberculosis before they are attested. Colonel Warner has made a survey of the men rejected for pulmonary tuberculosis at the time of enlistment and of cases of pulmonary tuberculosis developing in the Canadian Army between September, 1939, and March, 1942. The survey shows that 3,969 men, or 1 per cent of all recruits, were rejected because of tuberculosis at the time of enlistment, and that only 114 men developed symptoms of active tuberculosis after enlistment. A comparison of the results from clinical examination and the x-ray examination of the chest of recruits clearly shows that the vast majority of cases of active tuberculosis would not have been discovered without the routine x-ray examination. Of the 114 cases of tuberculosis which developed during service in the Army, 96 had negative chest x-rays at the time of enlistment. The duration of service before symptoms of active tuberculosis developed varied from six to twelve months. The average duration of symptoms until these cases were diagnosed and under treatment in hospital was less than three months, which is a very short period compared with the average duration of symptoms before a diagnosis of active tuberculosis is made in the civilian population. As provincial health authorities were notified of cases of active tuberculosis detected at enlistment, the Army examinations made possible the earlier detection and treatment of approximately 4,000 men with active tuberculosis.

In an article entitled "Psychoneurosis in the Canadian Army Overseas," Lieutenant-Colonel Hyland and Major Richardson have reported their results of a survey of 1,171 cases of mental disorders admitted to No. 1 Neurological Hospital. The survey showed that psychoneurosis constituted over 55 per cent of all cases of mental illness admitted to hospital. In this group, evidence of nervous instability prior to enlistment was found in 80 per cent of the cases, and in 56 per cent there was a family history of mental disease, neurotic symptoms, or alcoholism. The common precipitating factors of the psychoneuroses were, in order of frequency: difficulties in adaptation to army life, domestic worries, fears related to enemy action, and trauma. Over one-third of the cases treated in hospital were able to return to full duty and were carrying on effectively for periods of three to fifteen months after discharge from hospital. General measures for the prevention of war neurosis, with special reference to the present situation of the Canadian Army, were discussed. This report was published in a recent number of the *Canadian Medical Association Journal*.

At the request of Professor N. B. Taylor of the Department of Physiology, a preparation of isinglass (fish gelatin), which he had shown to be effective as a substitute for serum or plasma in the treatment of shock in animals, was tested for toxic effects following intravenous injection in humans. It was found that

an isinglass solution when properly prepared may be administered intravenously in man in amounts used for the treatment of shock without significant toxic effects. A limited clinical trial of an isinglass solution as a transfusion fluid in the treatment of shock has given promising results and warrants a more extensive clinical trial.

PUBLICATIONS

- BATES, G. "Venereal disease and the worker" (*Health*, vol. 10, 1942, pp. 8, 29-30).
- BROOKS, E. F. with BELL, R. G.. "Recovery from pneumococcal meningitis" (*Ontario Medical Association Bulletin*, vol. 10, 1943, pp. 51-2).
- with MAGNER, W. "Infectious mononucleosis with acute thrombopenic purpura" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 35-40).
- CAMPBELL, W. R. "Thyrotoxicosis and its treatment" (*Canadian Medical Association Journal*, vol. 48, 1943, pp. 110-13).
- DAUPHINEE, J. A., and HANNA, M. I. "Serum protein fractionation in certain diseases" (*Transactions of the Association of American Physicians*, vol. 57, 1942, pp. 82-7).
- CLARKE, A. P. W., and CLEGHORN, R. A. "Chemical study of tissue changes in adrenal insufficiency and traumatic shock" (*Endocrinology*, vol. 31, 1942, pp. 597-606).
- CLEGHORN, R. A. "A comparative assay of desoxycorticosterone acetate and acetoxypregnenolone in the adrenalectomized dog" (*Endocrinology*, vol. 32, 1943, pp. 165-9).
- with BONNYCASTLE, D.D. "A study on the blood volume of a group of untrained normal dogs" (*American Journal of Physiology*, vol. 137, 1942, pp. 380-3).
- CLEGHORN, R. A. CLARKE, A. P. W., and GREENWOOD, W. F. "Activity of desoxycorticosterone acetate in propylene glycol by oral and intravenous routes in adrenalectomized dogs, and its effect on the cardiac arrhythmia of adrenal insufficiency" (*Endocrinology*, vol. 32, 1943, pp. 170-5).
- DETWEILER, H. K. "Bromide intoxication" (*Canadian Medical Association Journal*, vol. 48, 1943, pp. 309-13).
- "The problems of allergy in general practice" (*Bulletin of the Academy of Medicine*, vol. 16, 1943, pp. 81-95).
- DICKSON, R. C., MCKINNON, N. E., MAGNER, D., and MCGILLIVRAY, N. B. "Meningococcal infection" (*The Lancet*, vol. 2, 1941, pp. 631-4).
- FOWLER, J. L. A., and CLEGHORN, R. A. "The response of splanchnic blood vessels and of the small intestine to vasoconstrictor influences in adrenal insufficiency in the cat" (*American Journal of Physiology*, vol. 137, 1942, pp. 371-9).
- GRAHAM, J. W. "War against arthritis" (*Health*, vol. 10, 1942, pp. 8, 27, 29).
- HEPBURN, J., and DAUPHINEE, J. A. "Successful removal of hemangioma of the lung followed by the disappearance of polycythemia" (*American Journal of Medical Sciences*, vol. 204, 1942, pp. 681-5).
- HYLAND, H. H. "Some observations on alcoholism in a Canadian military hospital overseas" (*University of Toronto Medical Journal*, vol. 20, 1943, pp. 221-7).
- and RICHARDSON, J. C. "Psychoneurosis in the Canadian Army overseas" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 432-43).
- OILLE, J. A. "Where we fail in the diagnosis and treatment of heart disease" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 305-10).
- OWEN, T. "Fatigue, rest and exercise" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 41-5).
- PARKS, A. E. "Bright's disease" (*University of Toronto Medical Journal*, vol. 20, 1943, pp. 117-39).
- WARNER, W. P. "Tuberculosis in the Canadian Army" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 193-6).
- WRONG, N. M. "The weather and the patient's skin" (*Canadian Medical Association Journal*, vol. 48, 1943, pp. 520-2).

OBSTETRICS AND GYNAECOLOGY

Under the direction of Professor W. A. Scott

The changes due to the war have made anything more than routine work in the department during the year 1942-3 impossible.

Although it has been necessary to curtail the work in the Out-Patient Department to some extent, little if any change has been made in the amount of instruction given to undergraduate students.

The amount of clinical material has not decreased, although in Gynaecology it has changed in character to some extent. The material for obstetrical teaching has even increased, and practical training in this department has not suffered.

A marked shortage of house surgeons during the past year put an added burden upon the Staff but increased the opportunities for practical training for the undergraduates.

PUBLICATIONS

COSBIE, W. G. "Prolonged labour" (*Bulletin of the Academy of Medicine*, Sept., 1942).

JOHNSTON, H. W. "The local use of sulfathiazole powder in gynaecological surgery" (*Canadian Medical Association Journal*, vol. 48, 1943, p. 238).

"Primary carcinoma of the vagina, with a report of three cases" (*Canadian Medical Association Journal*, vol. 47, 1942, p. 252).

OPHTHALMOLOGY

Under the direction of Professor W. W. Wright

Owing to the time needed for the teaching of Ophthalmology and routine work of the department by a depleted staff, little work has been done in the line of research on ordinary problems. However, Drs. A. E. MacDonald and H. M. Macrae have donated considerable time to work suggested by the National Research Council in connection with the war. At the Hospital for Sick Children, all cases of myopia are being investigated from the standpoint of nutrition and complete blood chemistry to determine if myopia is related to any lack of vitamin intake or disturbed metabolism. An orthoptic clinic has been established at the same hospital under a trained orthoptic technician. It is hoped to determine the true value of orthoptics in the treatment of strabismus.

PUBLICATIONS

MACDONALD, A. E. "Self inflicted injury resulting in enucleation" (*Canadian Ophthalmological Society*, 1942).

JOHNSTON, J. F. A. "Malignant exophthalmus" (*Canadian Ophthalmological Society*, 1942).

MORGAN, A. L. "Common eye diseases, diagnosis and treatment, illustrated by kodachrome slides" (*Canadian Medical Association*, 1942).

OTO-LARYNGOLOGY

Under the direction of Professor A. A. Campbell

The teaching of Oto-Laryngology has gone on as in former years in spite of shortages in the staff due to illness and military duties.

Dr. Howard McCart has returned from overseas after more than three years' service with number fifteen General Hospital.

During the year considerable study was given by Dr. A. A. Campbell to osteomyelitis of the frontal bone, and a report of the findings has been published.

Dr. D. E. S. Wishart has continued his studies on the question of deafness in children at the Hospital for Sick Children and has made a report on his studies in bronchiectasis in children.

Dr. H. H. Burnham is continuing his investigations on headaches of nasal origin.

PUBLICATIONS

- BURNHAM, H. H. "Headache from the oto-laryngologist's point of view" (*Bulletin of the Academy of Medicine*, vol. 16, June, 1943, pp. 171-7).
- CAMPBELL, A. A. "Osteomyelitis of the frontal bone" (*Canadian Medical Association Journal*, vol. 47, Sept., 1942, pp. 226-9).
- SULLIVAN, J. A. "Surgery of the mastoid" (*Archives of Oto-laryngology*, vol. 37, June, 1943, pp. 845-51).
- WISHART, D. E. S. "Bronchoscopy in the diagnosis and treatment of bronchiectasis in children" (*American Medical Association Journal*, vol. 120, Dec. 12, 1942, pp. 1181-6).
-
- "Rhinology in children" (*The Laryngoscope*, Aug., 1942).

PAEDIATRICS

Under the direction of Professor A. Brown

Studies have been continued on the retention of thiamine in the milling of flour. The greatest concentration of thiamine in wheat has been found to be present in the scutellum—the cells about but not actually within the germ. This portion of the wheat berry is lost to human consumption in the ordinary manufacture of white flour.

The thiamine content of Canadian breakfast cereals purchased in the open market has been determined. No thiamine could be found in puffed wheat, puffed rice, or cornflakes. In the uncooked cereals, such as rolled oats, oatmeal, and cracked wheat, no appreciable loss of thiamine occurred in cooking, whether the cereal was cooked according to the directions on the package, or was grossly over-cooked.

Studies are continuing upon the conservation of vitamins during storage and preparation of food for consumption. Great losses of ascorbic acid and thiamine are brought about by excessive cooking time, through the use of excessive amounts of water and the discarding of cooking water, and through too long a period between preparation and consumption of cooked foods. Public attention should be drawn to the finding that exposure of bottled milk to sunlight will rapidly destroy riboflavin. No milk deliveries in bottles should be allowed to remain in the open.

An extensive study of the diets of Toronto school teachers was undertaken in co-operation with the Toronto Teachers' Council and the Board of Education, the results of which are now being published.

A study has also been started to determine the changes which take place in the human eye and mouth as a result of administering certain vitamins.

A survey conducted in co-operation with the Dominion Bureau of Statistics and the Toronto Public Health Department of the heights and weights of Toronto school children has been partially analysed and published, and further analysis is being made to show the increase in stature in children since 1923, with numerous related factors, such as previous illnesses, economic position of the family, school district, etc.

In co-operation with the Department of Obstetrics of the University of Toronto, studies have been continued on the effect of certain food substances on the course of pregnancy.

In co-operation with the Dairy Department of the Ontario Agricultural College, Guelph, studies are in progress upon the riboflavin, calcium, and phosphorus contents of Ontario Cheddar cheese. Milks produced in various localities in Ontario, chosen for differences in soil conditions, have been analysed for these substances. Their concentration has also been determined in cheese and the by-products produced during its manufacture from these milks. The cheeses have been stored for maturation under conditions ranging from optimum to the poorest that might be met with in commercial practice, and the riboflavin

content is being determined at intervals up to one year. This study is being enlarged to include blue cheese, the production of which is rapidly increasing in the province due to the cutting off of previous sources of supply.

In co-operation with the Ontario Agricultural College, Guelph, the ascorbic acid content of various edible Ontario weeds, heretofore unutilized for human food, has been determined. In general the ascorbic acid content of these edible weeds is higher than that of ordinary cultivated greens. Studies are continuing upon the ascorbic acid content of tomatoes and other vegetables.

The effect of large doses of vitamin A over long periods upon conjunctival transparency in the human is being determined by means of slit lamp examination and colour photographs of the eye.

In experimental animals, very prolonged administration of sulfonamide drugs has been found to produce many deleterious results. From these results it would appear that self-medication with these drugs must be rigidly curbed.

In co-operation with the Connaught Laboratories, clinical and experimental studies are being continued on the prevention, diagnosis, and treatment of various infectious diseases. A review of 1,100 cases of meningitis occurring in the Hospital in twenty-two years was made. Clinical and bacteriological studies on a large number of these cases revealed that with newer methods of treatment, there has been a reduction of the case fatality rate in three of the bacterial types by 40 per cent. Researches on various products for immunization against whooping cough showed that the present whooping cough vaccine was as effective in immunizing animals as "toxin" and "toxoid" products. Studies on adults and children showed that very few individuals harboured strains of *H. influenzae* type "B" which is the cause of a fatal form of meningitis in children. In our bacteriological researches with beef liver extract, it was found that both *H. pertussis* (the causative agent of whooping cough) and *H. influenzae* type "B" (a cause of meningitis) grew more luxuriantly on media containing this substance. In addition, we have developed a media containing beef liver extract and immune serum that will rapidly isolate and type the meningeal strains of *H. influenzae* type "B". Clinical studies on pneumonia in infancy and childhood are in progress and various sulfonamides are being used. The results so far indicate that the more recent sulfonamide preparations are less toxic and just as effective as older preparations in shortening the course of the disease and in reducing the fatality rate.

PUBLICATIONS

- BROWN, A. "Some nutritional problems of the neonatal period" (*Journal of the Kansas Medical Society*, vol. 43, p. 369).
- and ROBERTSON, E. C. "Essential features concerning the proper nutrition of the infant and child" (*Canadian Medical Association Journal*, vol. 48, April, 1943, p. 297).
- BROWN, A. and ROBERTSON, E. C. "Factors to be considered in the construction of the diet of the older child" (*Journal of the Kansas Medical Society*, vol. 43, June, 1942, p. 237).
- DRAKE, T. G. H. "Medical caricatures of Thomas Rowlandson" (*Bulletin of Historical Medicine*, vol. 12, July, 1942, p. 323).
- EBBS, J. H. "Nutrition in pregnancy" (*Medical Clinics of North America*, March, 1943, p. 537).
- "Nutritive requirements in pregnancy and lactation" (*Journal of the American Medical Association*, vol. 121, Jan. 30, 1943, p. 339).
- and KELLEY, H. "The relation of maternal diet to breast feeding" (*Archives of Disease in Childhood*, vol. 17, Dec., 1942, p. 212).
- and MULLIGAN, F. "The incidence and mortality of breast fed and artificially fed infants admitted to hospital with infections" (*Archives of Disease in Childhood*, vol. 17, Dec., 1942, p. 217).
- JACKSON, S. H. "The thiamin content of breakfast cereals" (*Journal of the Canadian Dietetic Association*, June, 1943).
- KEITH, J. D. and BRICK, M. "Changes in the size of the heart in children" (*American Heart Journal*, vol. 24, Sept., 1943, p. 289).

- MCCREARY, J. F., MAY, C. D., and BLACKFAN, K. D. "Notes concerning the cause and treatment of coeliac disease" (*Journal of Paediatrics*, vol. 21, Sept., 1942, p. 289).
- ROBERTSON, E. C., DOYLE, M. E., and TISDALL, F. F. "Use of ultraviolet radiation in the reduction of respiratory cross infections" (*Journal of the American Medical Association*, vol. 121, March, 1943, p. 908).
- SILVERTHORNE, N. "Meningitis in childhood" (*Canadian Medical Association Journal*, vol. 48, March, 1943, p. 218).
- CAMERON, C., and PATERSON, M. "Further studies with H. Influenzae, Type B" (*Canadian Public Health Journal*, vol. 34, April, 1943, p. 175).
- and WALKER, A. "Bacillary dysentery" (*Archives of Disease in Childhood*, vol. 17, Dec., 1942, p. 210).
- SNELLING, C. E. "Disturbed kidney function in the newborn infant associated with decreased calcium phosphorus ratio" (*Journal of Paediatrics*, vol. 22, May, 1943, p. 589).
- "The use of evaporated half-skimmed milk in infant feeding" (*Canadian Medical Association Journal*, vol. 48, Jan., 1943, p. 32).
- and ERB, I. H. "Cystic fibrosis of the pancreas" (*Archives of Diseases in Childhood*, vol. 17, Dec., 1942, p. 220).
- and NELSON, W. "Vitamin K in hemorrhagic disease of the newborn infant" (*Journal of Paediatrics*, vol. 23, Jan., 1943, p. 77).

PATHOLOGICAL CHEMISTRY

Under the direction of Professor A. Hunter

In more than one previous report reference has been made to the difficulty of interesting fourth-year students in laboratory exercises of which they do not as yet appreciate the practical clinical importance. During the past session Dr. Nicholson has made a fresh effort to solve this problem by regrouping the procedures taught so as to present them, not in the old formal sequence, but in direct relation with selected clinical conditions. This plan has proved so successful with the fourth-year work, that it is planned to extend it to the fifth.

In November, 1942, the department lost, for the duration of the war, the services of Dr. A. G. Gornall, who has enlisted in the Royal Canadian Navy. Dr. Gornall has given eminent service both in teaching and in research. Through the kindness of Professor Best, Dr. W. G. E. Eggleton, Research Associate in Physiology, has been permitted to replace Dr. Gornall in the teaching of fourth-year students.

The loss of Dr. Gornall has been counterbalanced by the return from active service of Dr. R. W. I. Urquhart. Fortunately for the department, Dr. Urquhart has found it possible to combine the Directorship of the University Health Service with a resumption of his former duties as lecturer in Pathological Chemistry. The combination is one which, it is believed, will be of advantage both to the Health Service and to this department.

The total number of students enrolled in the department within the year was 362. Of these 359 were medical students of whom 110 completed their fifth year in December, 1942, 128 completed their fourth year and entered their fifth in January, 1943, and 121 commenced their fourth year in January, 1943. There were two graduate students, each majoring in Pathological Chemistry, and one candidate for the B.Sc. (Med.) degree. One of the graduate students completed his course and received the degree of Ph.D.

The department has carried out as usual the routine determinations of basal metabolic rate required by the surgical and obstetrical services of the Toronto General Hospital. The total number of such determinations was 150. These were made on 98 patients, of whom 91 were surgical and 7 obstetrical and gynaecological.

The development of the University Health Service under new directorship has led to a great increase in the number of specimens submitted to the department for routine clinical examination. The time taken up by these examinations

is now very considerable, and it becomes a question whether the department is justified in continuing this service without special arrangements for additional assistance.

RESEARCHES

The following is a partial list of research work carried on during the year:

HUNTER, A. and DOWNS, C. E. Continued studies of enzyme inhibitors and activators, with special reference to arginase.

GORNALL, A. G. and HUNTER, A. Urea formation in the mammalian liver.

MCARTHUR, C. S. Study of the phospholipids of the liver as affected by high-fat diets with and without choline (in co-operation with the Banting and Best Department of Medical Research).

ZIEGLER, J. A. The mechanism of riboflavin assimilation in relation to vision in bright light (in co-operation with the Departments of Physics and Paediatrics).

NICHOLSON, T. F. The effect of high carbohydrate diet and chronic staphylococcal infection on the glucose tolerance of the rabbit.

NICHOLSON, T. F. and NORQUAY, I. The site, and stimulus to, the formation of ammonia in the kidney.

NICHOLSON, T. F. and SIMPSON, W. The histological demonstration of phospholipid in the kidney (in co-operation with the Department of Pathology).

PUBLICATIONS

GORNALL, A. G. "Nitrogen study in the ornithine cycle of urea formation" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 421-3).

————— and HUNTER, A. "Synthesis of urea in the liver, with special reference to citrulline as an intermediary in the ornithine cycle" (*Journal of Biological Chemistry*, vol. 147, 1943, pp. 593-615).

HUNTER, A. "Renal function tests and their interpretation" (*University of Toronto Medical Journal*, vol. 20, 1943, pp. 140-9).

MCARTHUR, C. S. "The acetone-soluble lipid of the atheromatous aorta" (*Biochemical Journal*, vol. 36, 1942, pp. 559-70).

PATHOLOGY AND BACTERIOLOGY

Under the direction of Professor W. Boyd

The routine teaching has been carried out during the year. It has not been possible to fill the place of the lecturer in Pathology, Dr. Desmond Magner, who has been overseas on active service for more than three years. Dr. A. V. Postoloff, senior teaching fellow, has assumed the duties of the lecturer in addition to his own. The department has also been without the assistance of one teaching fellow, a fellow in Neuropathology, and three internes.

Successive groups of officers of the R.C.A.M.C., who are taking a course in Psychiatry, have availed themselves of the course of instruction given in Neurological Anatomy and Pathology to the graduate class taking the Diploma of Psychiatric Medicine.

Owing to the absence of neurological surgeons on active service, the Department of Surgery has had difficulty in carrying on the weekly museum demonstrations in Surgical Neuropathology to fifth-year students. Professor Eric Linell has therefore taken over this work for the present.

Professor W. L. Robinson, who is responsible for the teaching of General Pathology to the third year, again points out that the time available for teaching this fundamental subject has been cut down to such an extent that adequate instruction is impossible. Professor Robinson has been appointed Consulting Pathologist to the Attorney-General's Department, and also to the Department of Health of the Ontario Provincial Government.

The last of the Museum rooms has been converted to the new system first instituted in 1937. A ventilating system has been installed in the Museum

which will make it possible to carry on teaching and study in these rooms during the hot weather. Previously work under hot weather conditions was almost impossible. The continued lack of a Museum fellow is again met by the efficiency of Miss V. L. McKinnon in describing and cataloguing new material. During last summer Mr. E. F. Routley and Mr. D. C. Robertson rendered valuable service in the Museum along similar lines. The addition of a fine series of coloured plates of blood disorders and clinical illustrations of endocrine diseases has increased the teaching value of the Museum. So also has the addition of many gross and a few microscopic Kodachrome pictures of pathological lesions.

In the Autopsy Division Dr. A. V. Postoloff has analysed all the available material on Ewing's tumour of bone, and has presented his results to the Ontario Pathologists' Association. He has also studied the nature and genesis of endothelioma of the pleura. Dr. S. Dubo is investigating a series of cases of rupture of the oesophagus following cerebral lesions or operations on the brain, and Dr. D. R. Bohnen is studying the early lesions in intestinal lipodystrophy.

The activities of the Division of Bacteriology have been largely concentrated on the study and the production of penicillin under the direction of Dr. P. H. Greey. Penicillin, the product from the growth of the common mould *penicillium notatum*, is far superior to any of the sulphonamides in its antibacterial action and its low toxicity, but the amount available for clinical use is extremely small. The culture medium for growing the mould has been modified and an increased yield of penicillin has resulted, but further studies are still in progress. The quantities of medium being used have increased enormously since this work has been aided by a grant from the National Research Council and is approaching the pilot plant stage.

The culture fluid containing the antibacterial substance has been given to the Banting and Best Department of Medical Research where Dr. S. F. MacDonald under the supervision of Dr. C. C. Lucas is investigating the most efficient methods for the extraction and purification of the penicillin. Potency tests needed at every step in the processing are carried out in the Department of Bacteriology.

Cultural studies on the incidence of bovine strains of the tubercle bacillus in children have been continued by Dr. R. M. Price and for the second successive year only the human strains have been found. This indicates the efficiency of the milk pasteurization programme of the provincial government.

Biological studies with the vole bacillus, the animal strain of acid-foot bacillus which recently has been suggested as a possible source for a vaccine in man, have shown that guinea pigs injected with this bacillus become sensitized to human and bovine tuberculin, an interesting finding.

In the Division of Surgical Pathology Dr. M. Howson has studied all the available examples of Hürthle-cell adenoma of the thyroid gland. She presented her results to the Academy of Medicine.

In the Division of Neuropathology Dr. M. I. Tom has completed a paper dealing with the regeneration of the motor end-plates of voluntary muscle after division and suture of peripheral nerves.

During the past year new editions have appeared of Professor Boyd's *Text Book of Pathology* (fourth edition) and *Surgical Pathology* (fifth edition). In preparing coloured illustrations for the former, valuable assistance has been given by the Art Service under the direction of Miss M. T. Wishart.

PUBLICATIONS

- BOYD, W. "A brief on cancer control" (*The Canadian Hospital*, vol. 20, 1943, pp. 17, 54, and 56).
 ——— "Changing concepts of pyelonephritis" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 128-33).
 ——— *Surgical pathology*, 5th ed. Philadelphia: W. B. Saunders Co. 1942.
 ——— *Text book of pathology*, 4th ed. Philadelphia: Lea and Febiger, 1943.

- DUFFIN, J. D. "Cortical necrosis of the adrenals associated with Addison's Disease" (*Archives of Pathology*, vol. 35, 1943, pp. 649-66).
- "Liver necrosis following burns" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 138-9).
- ERB, I. H., and MORGAN, E. M. with FARMER, A. W. "The pathology of burns" (*Annals of Surgery*, vol. 117, 1943, pp. 234-55).
- HANNAH, J. A. "The Associated Medical Service of Toronto" (*Minnesota Medicine*, vol. 25, 1942, pp. 616-24).
- "Implications of health insurance" (*Drug Merchandising*, vol. 24, 1943, pp. 7 and 36).
- MACINTOSH, O. C. "The preparation of transudates and exudates for paraffin embedding" (*Journal of Technical Methods*, vol. 22, 1942, pp. 97-8).
- "Purification of paraffin" (*Journal of Technical Methods*, vol. 22, 1942, pp. 99-100).
- MAGNER, W. with BROOKS, E. F. "Infectious mononucleosis with acute thrombopenic purpura" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 35-40).
- OGRYZLO, M. A. "The Arnold-Chiari malformation" (*Archives of Neurology and Psychiatry*, vol. 48, 1942, pp. 30-46).

PHARMACOLOGY

Under the direction of Professor V. E. Henderson

The teaching in this department has, on the whole, gone very satisfactorily though the double teaching that has had to be done for medical students has entailed rather a strain on all members of the teaching staff and has led to some undue strain on the students. They have been a little more inclined to shirk their work than usual.

The research progress in this department has been greatly decreased owing to the character of the staff, shortage of animals, and the inability to obtain supplies for making apparatus, and also to the increased amount of teaching that has had to be carried out.

Professor Henderson has completed the study of the effects of respiratory stimulants in rabbits and a report on this work has been prepared and will be published in due course. A beginning has been made of a study of the effects of high cardiac rates on blood pressure and the distribution of blood in the body, in an attempt to explain the symptoms produced by tachycardia.

Dr. Lucas, in conjunction with Dr. A. W. Ham, has been entirely engaged in war research in certain toxic substances, a full report of which cannot be given, but several reports have been furnished to the National Research Council.

Dr. M. H. D. Gunther has continued her study of her survey of lactation and this material is nearly ready for publication. Mrs. M. O. Sweeten has been studying some pharmaceutical problems and has finished up her work on digitalis standardization.

Members of the department have also undertaken investigations for the Chemical Warfare Service and for the Air Force, details of which naturally cannot be given.

PUBLICATIONS

- BONNYCASTLE, D. D. "The effect of some anaesthetic agents on the volume of body fluid" (*Journal of Pharmacology and Experimental Therapeutics*, vol. 75, 1942, pp. 18-29).
- and CLEGHORN, R. A. "Blood volume of group of untrained normal dogs" (*American Journal of Physiology*, vol. 137, 1942, pp. 380-3).
- GUNTHER, M. H. D. "Lactation in women" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 410-14).
- HENDERSON, V. E. "The plague of drug names" (*Canadian Pharmaceutical Journal*, vol. 76, 1943, pp. 32 and 54).
- and CHUTE, W. L. *Materia medica*. Toronto: The Macmillan Company of Canada. 1943. Pp. 160.

LUCAS, G. H. W. "The battle against infection" (*Health*, spring, 1942, pp. 17, 25, and 30).

SWEETEN, M. O. "Corn syrup in wartime prescriptions" (*Canadian Pharmaceutical Journal*, vol. 76, 1943, p. 41).

PHYSIOLOGY

Under the direction of Professor C. H. Best

The teaching load of the department continues to increase. A special course for naval medical officers on Aspects of Naval Medical Research was given. A course on Nutrition for naval dietitians is now being arranged.

Word has again been received that Dr. Jacob Markowitz is a prisoner of war. Major A. L. Chute, who is attached to the Medical Research Council in England and who served during the past year in Libya, has spent several weeks in Canada. He has brought back a great deal of valuable information.

The Department of External Affairs (Ottawa) has notified the University that the Head of this department has been made an Honorary Member of the Argentine Society of Biology. Dr. Best has been elected Chairman of the Board of Scientific Directors of the International Health Division of the Rockefeller Foundation. The work on this board, and that with the R.C.N. Medical Research Unit, are mutually helpful.

During the first half of the academic year a large part of Dr. N. B. Taylor's time was devoted to revising the *Physiological Basis of Medical Practice*. The third edition of this text came off the press in April. The researches into the use of isinglass as a blood substitute, which have been undertaken with the assistance of Miss M. S. Moorhouse, are progressing satisfactorily. This material has been thoroughly tested on a large number of animals and has been proved to be free from antigenic or any other toxic action. Animals bled rapidly to the extent of from 50 to 73 per cent of their blood volume recover completely if the lost blood is replaced by a 4 per cent solution of isinglass. Some 90 patients have been treated with this blood substitute. In the last series of 28 clinical trials a mild febrile reaction occurred in two instances, but none of the patients experienced a chill or any other discomfort. In one case of a severe burn, 3800 cc. of the solution were transfused within twelve hours. Haemoconcentration was well controlled and the patient carried through the stage of shock in a most satisfactory manner. At the request of the Subcommittee on Shock and Blood Substitutes of the National Research Council, Dr. R. D. Defries, Director of the Connaught Laboratories, has kindly undertaken the manufacture of purified isinglass on a larger scale than is feasible in the Department of Physiology.

The research facilities of the Section of Biophysics, under the direction of Surgeon Lieutenant Commander D. Y. Solandt, have been devoted almost entirely to the study of Naval Medical Research problems. Dr. R. Partridge and Surgeon Lieutenant H. D. Hebb have been engaged in the investigation of certain phenomena of the human hearing of importance in the operation of submarine detection devices. Surgeon Lieutenant J. W. Scott has undertaken research in problems of ventilation and lighting in connection with naval establishments and naval vessels. A survey of methods used for testing night vision has been completed and a test suited to the needs of the Royal Canadian Navy has been devised. Surgeon Lieutenant C. Smith is at present occupied in applying this test to naval personnel. Messrs. J. D. Brown and K. Roseblade assisted in the design of visual acuity test apparatus for use by the Navy and have been responsible for building thirty devices of the type approved by the naval authorities. A device, named the Dichroic Anomaloscope, has been designed for giving a more precise evaluation of minor defects of colour vision than is possible with any other test at present available. Mr. K. Roseblade has constructed a satisfactory model of this machine and has carried out tests on a large number of subjects. Experimental work on "immersion-foot" conducted

by Mr. M. L. Bunker has yielded useful practical results. Personnel of the Section of Biophysics have carried out noise level surveys and noise analysis for the R.C.A.F., and other projects of a secret nature have been undertaken for the armed services.

During the past academic year the work on Naval Aspects of Nutrition, under Lieutenant Commander J. Campbell, has been continued. This work forms part of the activities of the Naval Medical Research Unit, and is carried out by a group composed of naval and civilian personnel in the Department of Physiology. The civilian personnel are W. G. E. Eggleton, Ph.D., F.I.C., and Miss E. J. Reed, M.A.

The investigations completed since January, 1943, have been described in the following reports:

Menus for sea cadets at summer camps—by Miss E. J. Reed, February 3, 1943.

R.C.N. vitamin tablets data for naval information—March 18, 1943.

Emergency rations for survivors—Medical Research Unit Nutrition Report No. 18, by W. G. E. Eggleton, Miss E. J. Reed and J. Campbell, February 20, 1943.

Tests on whole milk powders—April 20, 1943.

Interim report on water canning — by J. Campbell, Lieutenant Commander (S.B.) R.C.N.V.R., April 21, 1943.

In addition to the work in nutrition, investigations on other subjects have been carried out, as described in the following reports:

Report on a sample of "Nacconol NRSF Jelly—BC-40487, Product II", for use in removing oil and grease from burnt and scalded skin surfaces and a proposed alternative formula by W. G. E. Eggleton, February 24, 1943.

Proposed rain-water trap—by J. Campbell, Lieutenant Commander (S.B.) R.C.N.V.R., April 19, 1943.

Investigations have also been carried out on the properties of fillers for producing buoyancy in life-saving equipment.

Dr. R. E. Haist and his group have continued the study of secondary shock in experimental animals. A simple and reliable method for producing shock in rats has been developed. Dr. W. S. Hoar has attempted to determine whether or not a toxic material is liberated in shock. Exsanguination-transfusion experiments in which blood from shocked dogs was transfused into animals suffering from severe haemorrhage failed to give any evidence of a circulating toxic material in shock. Exchange transfusions between shocked dogs and normal dogs were carried out over a long period. No evidence for a potent toxic material was obtained, but the non-shocked member of the cross-circulated pair showed signs of injury not seen in control cross-circulated animals.

A method was developed for comparing the efficacy of different blood substitutes in the shocked animals. Comparative studies on plasma, isinglass, and polyvinyl alcohol as blood substitutes are in progress.

Miss J. I. Hamilton has studied kidney changes in dogs which had a pressure cuff applied to one leg for ten hours. Definite changes in kidney function were evident. These animals showed many of the changes of the "crush-syndrome" but tended to return to normal in a few days rather than become progressively worse. Miss Hamilton is also studying carbohydrate changes in shock and has obtained interesting positive results. With Dr. T. F. Nicholson of the Department of Pathological Chemistry, Miss Hamilton is continuing some work concerning kidney changes in shock. Miss H. J. Bell has studied the changes in blood sugar, blood phosphorus, and blood calcium in shocked dogs. Dr. J. M. Fisher of the Department of Biochemistry concluded her studies on potassium changes in the shocked dogs. A considerable elevation of the potassium level in the medulla oblongata of the shocked animals was observed. Dr. K. C. Fisher of the Department of Zoology has been studying brain respiration in the shocked animals and controls. Some interesting differences have been noted. The studies are being continued. Dr. A. W. Ham of the Department of Anatomy is continuing the study of tissue changes in shocked dogs and rats.

Miss Bell and Dr. Haist have continued a few experiments on the insulin content of pancreas. The effect of a long period of insulin injections, the influence of a high protein diet in adrenal-ectomized animals, and the effect of partial thyroidectomy have been studied.

Last year a grant was made by the John and Mary R. Markle Foundation to help support studies on heparin by Dr. L. B. Jaques and his colleagues. The first year has been spent in developing accurate chemical methods to be used in such studies. Two methods were required and their development has been investigated—namely, an accurate method for the determination of small quantities of heparin in blood and an accurate method for the determination of heparin in tissues. Progress in this has naturally been slow, since there has been no previous attempt to develop such methods for any components of the clotting system. The only method for estimating heparin in blood is the protamine titration, which gives only a rough estimate and, further, does not detect heparin at the normal blood level. The only method for estimating heparin in tissues is an adaptation of the method of Charles and Scott for the commercial preparation of the substance from beef lung. It is hoped that the development of accurate methods for blood and tissue heparin will not only add considerably to our knowledge of the normal physiology of heparin, but will also suggest that similar methods should be developed for other clotting factors.

The work on heparin in blood has been carried out by Miss U. Dale and that on tissue heparin by Dr. M. T. C. Mitford. The advance has been slow but definite progress has been made. Dr. Jaques, in addition to supervising this work, has attacked other problems in the field of blood clotting, in which he has become a recognized authority.

Dr. E. Fidler has continued his work on the changes in blood cells during shock. He has given valuable service at the Toronto Red Cross Blood Donor Clinic and has carried a very considerable load of teaching.

The respiration and the activity of the oxidative enzymes in normal and ischaemic dog and rabbit kidney have been studied by Dr. S. B. Raska. The results obtained have shown that there is a significant decrease in the oxygen consumption of the tissue slices from the ischaemic kidneys. Also, the oxidizing power of the kidney slices for amines and amino-acids was found to be markedly reduced.

PUBLICATIONS

- BEST, C. H. "Medical research and the diabetic" (*Diabetic Journal*, vol. 3, 1942, pp. 9-11).
 ——— SOLANDT, D. Y., and RIDOUT, J. H. "The Canadian project for the preparation of dried human serum for military use" (*Blood substitutes and blood transfusion*, Springfield, Thomas, 1942, pp. 235-41).
 ——— and TAYLOR, N. B. *The physiological basis of medical practice*, 3rd ed. Baltimore: Williams and Wilkins. 1943.
 SOLANDT, D. Y., and BEST, C. H. "Studies on the etiology of traumatic shock" (*Blood substitutes and blood transfusion*, Springfield, Thomas, 1942, pp. 18-23).
 TAYLOR, N. B. "Blood substitutes for transfusion" (*University of Toronto Medical Journal*, vol. 19, 1942, pp. 164-8).

PSYCHIATRY

Under the direction of Professor C. B. Farrar

The undergraduate teaching programme was essentially the same as the year before, except that in the accelerated programme several hours were lost from our already short instruction schedule.

In the graduate course four candidates registered from the Ontario Hospital Service; one, however, was accepted in the armed forces and had to discontinue. The three remaining completed the course leading to the degree of D.Psych. Dr. M. Straker ranked highest in this course and was awarded the Faulkner Medal.

On request of the Canadian Army Medical Corps, a plan has been formulated for psychiatric instruction for medical officers detailed from the Service. In the programme now in operation three selected medical officers are attached to the staff of the Psychiatric Hospital for two months, and during this time receive, in addition to ward assignments, a series of lectures and clinical demonstrations. The district psychiatrist, who formerly completed the graduate course in this department, assists with the course. The second class of three medical officers is now taking this course. The total programme includes two months at the Psychiatric Hospital, two months at the Toronto General Hospital in psychosomatic medicine, one month at Christie Street Hospital in the neurological service and two months at district headquarters or attached to medical boards.

During the year two additional staff members, Dr. G. H. Lugsdin, demonstrator, and Dr. J. G. Dewan, research fellow, have joined the armed forces and have been granted leave of absence for the duration of the war.

Miss Mary Smith was appointed as dietitian on May 1, 1942, in the research division. Miss E. V. Gifford, psychologist in the research division, having married, resigned on August 31, 1942. She has been succeeded by Miss Janet MacKendrick, who is satisfactorily carrying on this work. Miss Pauline Tancock, occupational therapist in the research division, also married and resigned her position on August 31, 1942. Miss Audrey Hughes has taken over the work in Occupational Therapy in the research division.

RESEARCHES

Research work continues jointly with the Department of Medical Research under a Rockefeller grant. The observations to date on carbohydrate metabolism in schizophrenia suggest that as the patient's mental condition approaches the normal, so do the glucose tolerance and pyruvate tolerance observations which, at the height of the mental illness, are significantly abnormal. A publication covering these observations is to be presented at the 1943 meeting of the American Psychiatric Association. Along with the abnormalities noted above, it has been observed, particularly in the cases of catatonic schizophrenia, that the respiratory quotients and basal metabolic rates are grossly abnormal, the former varying from 0.60 to 1.45 and the latter often ranging between minus 35 and minus 40. Investigation on insulin tolerance and the effect of desoxycorticosterone acetate on the glucose, pyruvate, and insulin tolerance, has begun in an endeavour to determine further the nature of carbohydrate metabolism in schizophrenia. A prolonged coma in hypoglycemic shock therapy occurred, and the carbohydrate metabolism of the patient during this coma demonstrated an abnormally wide range in blood sugars which showed no relation to the carbohydrate intake of the patient. This unusual lability disappeared when the patient's clinical picture returned to normal. These findings have been reported in a publication of the *American Journal of Psychiatry*.

A novel electroshock apparatus has been investigated, which uses an interrupted unidirectional current, and this has been compared with the standard electroshock equipment which utilizes raw alternating current. We have reported that the unidirectional fluctuating current uses significantly less power to produce the necessary grand mal convulsion and does not cause cerebral dysrhythmia as frequently as the raw alternating current type of electroshock. The cases in which cerebral dysrhythmia does occur, using unidirectional fluctuating current, were not significantly improved, so that it is possible in this latter type of electroshock we have an observation of prognostic value.

The electroencephalograph of a patient suffering from schizophrenia of the hebephrenic type was found to show abnormalities which also occurred in her father's electroencephalograph, thus demonstrating an hereditary factor in this abnormality. A full report on the comparison of the electroencephalographs of the entire family has been submitted for publication.

Two cases of recurrent psychoses, in which an obvious environmental factor was present, have been followed, and the dynamics behind these psychoses discussed, pointing out the ever-present problem in assessing and correcting the environmental factor in mental diseases.

There has been a publication on an alcohol detoxication mechanism in the central nervous system by a member of the research staff, and also a paper on measuring abnormal pattern on the revised Stanford-Binet Scale.

Our publications, in most part, have been preliminary reports as the projects require long periods of observations resulting in a gradual accumulation of data. The main project continues to be the correlation of biochemical, physiological, electro-physiological, psychiatric, and psychological findings.

PUBLICATIONS

- DEWAN, J. G. "An alcohol detoxication mechanism in the central nervous system" (*American Journal of Psychiatry*, vol. 99, pp. 565-8).
- FARRAR, C. B. "Euthanasia" (*American Journal of Psychiatry*, vol. 99, pp. 141-3).
- "Psychiatry" (*The 1942 New International Year Book*, New York, Funk and Wagnalls Co., 1943).
- "Richard Dewey" (*Dictionary of American Biography*).
- McGHIE, B. T. "Public health and the practice of medicine" (*Camsi Acemi. Journal of Canadian Association of Medical Students and Internes*, II, March, 1943, 42-8).
- MYERS, C. R., and GIFFORD, E. V. "Measuring abnormal pattern on the revised Stanford-Binet Scale (Form L)" (*Journal of Mental Science*, vol. 374, pp. 92-101).
- PROCTOR, L. D. and EASTON, N. L. "An unusual case of prolonged coma in hypoglycemic shock treatment" (*American Journal of Psychiatry*, vol. 99, pp. 203-9).
- and GOODWIN, J. E. "Comparative electroencephalographic observations following electro-shock therapy using raw 60 cycle alternating and unidirectional fluctuating current" (*American Journal of Psychiatry*, vol. 99, pp. 525-30).

RADIOLOGY

Under the direction of Professor G. E. Richards

During the year the regular courses for undergraduate students have been carried on without any material change and these are to be continued without curtailment due to war conditions.

Special courses were provided for medical radiologists and technicians both for Army and Air Force personnel. The courses for medical radiologists were of four months each and were conducted in conjunction with the Department of Physics, Pathology, and Anatomy and the Departments of Radiology of Western Hospital, St. Michael's, Christie St. Hospital, and Chorley Park Military Hospital, to all of whom our sincere thanks are tendered. Twenty-four medical officers for the Army, four for the Air Force, and four civilian doctors attended these courses which were very intensive and occupied each day from 9 A.M. to 5 P.M.

The courses for technicians were of two months' duration, were equally intensive and were attended by a total of seventy-four students for both services including four civilians.

These special courses added considerably to the work of the staff and would have been almost impossible had it not been that we were fortunate in securing the timely assistance of Dr. H. M. Worth who has now joined the staff. Dr. Worth was Senior Radiologist to Guy's Hospital, London, England, for twenty-three years but owing to ill-health was compelled to give up this position some years before the outbreak of the war. He is now sufficiently recovered to undertake certain duties and will be a very welcome addition to the staff.

Other staff changes include the return from overseas of Dr. (Major) A. C. Singleton, who went overseas with No. 15 General Hospital and served as

Radiologist with that unit for three years. He has now been appointed Consultant Radiologist to the Air Force in the rank of Wing Commander.

Dr. (Capt.) Jos. Sommers left the Department in November, 1942, to proceed overseas as Senior Radiologist to No. 10 General Hospital.

SURGERY

Under the direction of Professor W. E. Gallie

This department is glad to be able to report that it has completed another year of the accelerated programme without a serious let-down in the quality of the teaching. This has been accomplished, however, only by greatly increased effort on the part of the depleted staff and with the help of former teachers and voluntary assistants. Dr. R. V. B. Shier, Dr. Jessie Gray, Dr. M. H. V. Cameron, Dr. Wallace Scott, Dr. H. F. Robertson and Dr. G. W. Carrow have given us assistance without which we could not have carried on.

During the year the staff has been further depleted by the appointment of Dr. R. I. Harris as Consultant in Surgery, R.C.A.M.C., with the rank of Lieutenant-Colonel. He is at present on duty in England and will be away for several months. Dr. A. W. Farmer has been appointed Chief Consultant in Surgery to the Air Force with the rank of Squadron Leader. Dr. Stewart Thomson and Dr. R. C. Laird have both joined the Air Force with the rank of Squadron Leader and have been made Consultants in Surgery.

Reference was made in last year's report to the disruption of the programme of training of surgeons which had been established for some years in the four teaching hospitals. This resulted from the induction into the medical services of the armed forces of all medically fit graduates at the end of their eight months' general internship. I am glad to report, however, that this misfortune has been overcome by an agreement with the Directors General of the Medical Services whereby officers who have shown aptitude for surgery and who have been applied for by one of the hospitals may be seconded for duty in that hospital for periods of six months. Under this plan Captain F. P. Dewar has been returned from England after two years' service in the R.C.A.M.C. to act as Resident Surgeon at Toronto General Hospital, and Captains N. C. Delarue and W. D. Stevenson have been sent back for special training in neurosurgery and Major T. S. Perrett for similar training in Orthopaedic Surgery. Flight Lieutenant F. B. Thomson has been seconded from the Air Force for preliminary general surgical training and Lieutenant Commander Fahrni from the Navy. At St. Michael's Hospital, Captain J. E. Bateman, R.C.A.M.C., is Resident and at the Western Hospital, Flight Lieutenant J. R. Francis is Senior house surgeon. At the Children's Hospital Captain G. E. Cooper has been brought back from the Pacific coast for six months as Resident.

While these periods of six months' intensive training are not the equivalent of the regular peace-time programme, nevertheless they are infinitely more valuable to the medical services than no training at all as they will keep up a steady supply of young surgeons at a time when they are most needed. Further, if the present plan is adhered to, the education of these young men will be continued after their return to their respective medical services by periods of months on general and special surgical wards both in Canada and overseas. The result in the long run will be that the disruption of our plan of education for young surgeons will not be so bad as we had feared and that when the war is over those men who had been selected because of their aptitude, for surgical training, will have been trained and will be ready to take their places immediately in civilian life.

In addition to arranging for the resumption of our programme of training in surgery for our own men, we have been able to assist the medical services by giving special appointments for periods of months to officers who needed training

in special branches of surgery to fit them for general service. Thus, Lieutenant-Colonel A. W. S. Hay of No. 18 General Hospital spent three months with Drs. Shenstone and Janes, in Thoracic Surgery, and Squadron Leader L. J. Williams, R.C.A.F., and Surgeon Lieutenant Breckenridge, R.C.N.V.R., spent four months each with Dr. R. I. Harris in Orthopaedic Surgery. Besides these special appointments, which were really similar to junior staff appointments, the department combined with the Department of Medicine in giving a six weeks' special course of instruction to a group of fourteen Naval Officers who had returned to Canada after two years' service with the Royal Navy. With them should have come Surgeon Lieutenant Jacques Bourgeois, one of the Fellows in Surgery, had not fate decreed that he should die in action at Oran, when H.M.S. *Hartland*, of which he was ship's surgeon, broke the harbour boom. This young man, the first to be sent to us for training in Surgery from the French Canadian universities, had made a warm place for himself in the hearts of the department and his loss is deeply mourned. In addition, the department conducted two special courses for medical officers on the use of the Stader splint in the treatment of fractures. These courses were for one week each and included work on the cadaver as well as on the wards.

Signal honour was paid this year to two members of the staff, Dr. N. S. Shenstone and Colonel J. A. MacFarlane who were awarded Honorary Fellowship by the Royal College of Surgeons of England.

Promotions gazetted during the year are as follows:

S. D. Gordon from Major to Lieutenant-Colonel, R.C.A.M.C.

W. S. Keith from Captain to Major, R.C.A.M.C.

J. R. F. Mills from Captain to Major, R.C.A.M.C.

W. K. Welsh from Surgeon Lieutenant to Surgeon Lieutenant Commander, R.C.N.V.R.

D. R. Mitchell from Surgeon Lieutenant to Surgeon Lieutenant Commander, R.C.N.V.R.

A list of the members of the surgical department now serving with the armed forces is as follows:

General Hospital:

Colonel J. A. MacFarlane, Consultant in Surgery, C.A.O.

Lieutenant-Colonel R. I. Harris, Consultant in Surgery, Ottawa.

Lieutenant-Colonel E. H. Botterell, Senior Surgeon No. 1 Neurological Hospital.

Lieutenant-Colonel S. D. Gordon, Senior Surgeon Plastic Unit.

Lieutenant-Commander D. R. Mitchell, R.C.N.V.R.

Lieutenant-Commander W. K. Welsh, R.C.N.V.R.

Major C. Aberhart, In Charge of Urology, No. 15 General Hospital.

Major F. G. Kergin, No. 15 General Hospital.

Major J. R. F. Mills, 1st Canadian Field Surgical Unit.

St. Michael's Hospital:

Lieutenant-Colonel J. W. Ross, Senior Surgeon, Camp Borden Military Hospital.

Major C. H. Watson, In Charge of Surgery, Rideau Military Hospital.

Major T. R. Sarjeant, No. 15 General Hospital, C.A.O.

Major J. W. Brennan, In Charge of Surgery, Chorley Park Military Hospital.

Toronto Western Hospital:

Lieutenant-Colonel A. W. M. White, In Charge Surgery, No. 15 General Hospital, C.A.O.

Major H. R. C. Norman, In Charge Surgery, No. 11 General Hospital.

Squadron Leader R. C. Laird, Consultant in Surgery, R.C.A.F.

Hospital for Sick Children:

Major W. S. Keith, No. 1 Neurological Hospital, C.A.O.

Squadron Leader A. W. Farmer, Chief Consultant in Surgery, R.C.A.F.

Squadron Leader S. A. Thomson, Consultant in Surgery, R.C.A.F.

Early in the year Dr. A. B. LeMesurier returned from duty with the Canadian Orthopaedic Unit in Scotland and later Dr. F. R. Wilkinson returned also, making it possible for other members of the staff of the Hospital for Sick Children to serve.

In spite of the depletion of the staff and the great increase in the work resulting from the acceleration of the course and the extra courses for medical officers, the general plan of teaching has not been disturbed. Lectures, ward clinics, ward rounds, outpatient clinics, and follow-up clinics go on much as in peace-time which is very different from conditions in 1914-18. The follow-up clinic established in the General Hospital has expanded greatly and resulted in two excellent studies. One on "Gastrectomy," by Dr. C. B. Parker, covered 549 patients and was a masterly review of the immediate results and the subsequent history as obtained in the follow-up clinic. The other was an interesting review by Dr. H. W. Wookey of the late history of a hundred cases of perforated duodenal ulcer upon which he had reported ten years previously. These critical follow-up studies are the basis of sound surgical judgment.

RESEARCHES

Reference was made last year to several committees of the surgical staff appointed to make reports to the National Research Council on subjects of interest to the armed forces. The committee on burns, under the chairmanship of Dr. A. W. Farmer, in collaboration with a similar committee at McGill, prepared the manuscript of a manual which was published by the Research Council and widely distributed. Another committee under the chairmanship of Dr. D. E. Robertson made a study of the action of the sulfonamides when applied locally in the treatment of wounds and compound fractures. These results, while not conclusive, add to the evidence that the drugs are helpful in holding down infection. Dr. R. I. Harris has prepared a brochure on the diagnosis and treatment of pathological conditions of the feet in soldiers, and another committee of orthopaedic surgeons is engaged in the preparation of a manual on amputations.

The question of the influence of the local application of sulfonamide in the peritoneal cavity was investigated by Dr. J. Gray in a long series of experiments on animals. Her conclusions were that the drug did no harm and that it definitely controlled infection and lowered the mortality rate.

PUBLICATIONS

BOTTERELL, E. H. with JEFFERSON, G. "Treatment of scalp wounds in air-raid and other casualties" (*British Medical Journal*, vol. 1, June 27, 1942, p. 781).

DANIS, J. T. "Ano-rectal pain: Causes and treatment" (*University of Toronto Medical Journal*, vol. 2, Dec., 1942, pp. 60-7).

DUFF, T. A. J. "Duodenal ulcer: A clinical discussion on the treatment and the complications following gastroenterostomy, with two case reports" (*University of Toronto Medical Journal*, vol. 20, Dec., 1942, pp. 55-9).

FARMER, A. W. "Experience with burns at the Hospital for Sick Children" (*American Journal of Surgery*, new series, vol. 59, no. 2, pp. 195-209).

—————"Hypospadias" (*Surgery*, vol. 12, no. 3, pp. 462-70).

————— with ERB, I. H., and MORGAN, E. M. "The pathology of burns" (*Annals of Surgery*, vol. 117, Feb., 1943, pp. 234-55).

————— with WEBSTER, D. R., and WOOLHOUSE, F. M. "Medical report on the St. John's conflagration" (*Canadian Medical Association Journal*, vol. 48, 1943, pp. 191-6).

- FOULDS, G. S. "An unusual kidney tumor malignant papillary cystadenoma and papillary carcinoma with clear cells" (*Journal of Urology*, vol. 48, Aug., 1942).
- GORDON, S. D. "Wire suturing in the treatment of facial fractures" (*Canadian Medical Association Journal*, vol. 48, pp. 406-9).
- with GORDON, R. A. "Thermal burns" (*Canadian Medical Association Journal*, vol. 48, April, 1943, pp. 302-9).
- GRAY, J. "Successful removal of a sacral parasitic fetus" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 520-2).
- HARRIS, R. I. "Recent advances in the treatment of burns" (*University of Toronto Medical Journal*, vol. 20, March, 1943).
- "Wartime amputations: The value of end bearing stumps in the lower extremity" (*Wisconsin Medical Journal*, Dec., 1942, pp. 1086-90).
- LAIRD, R. C. "Historical outline of the progress of thoracic surgery" (*University of Toronto Medical Journal*, vol. 19, Dec., 1942, pp. 92-6).
- McCLELLAND, J. C. "An interesting case of testicular tumor" (*Transactions of the G.U. Surgeons*).
- "Tuberculosis involving the genitourinary tract following trauma" (*New York State Journal of Medicine*, vol. 43, Jan. 15, 1943, pp. 135-9).
- McCOMB, R. A., and PEARSE, R. "Further results in uretero-sigmoid anastomosis and cystectomy" (*Canadian Medical Association Journal*, vol. 48, March, 1943, pp. 215-17).
- MACFARLANE, J. A. "Wounds in modern war" (*Journal of Bone and Joint Surgery*, vol. 24, Oct., 1942, pp. 739-52).
- McKENZIE, K. G., and BOTTERELL, E. H. "The common neurological syndromes produced by pressure from extrusion of an intervertebral disc" (*Canadian Medical Association Journal*, vol. 46, 1942, pp. 424-35).
- MURRAY, G. "Small bone grafts of extremities" (*Canadian Medical Association Journal*, vol. 48, 1943, pp. 137-9).
- with MACKENZIE, R. "Postoperative thrombosis and embolism" (*American Journal of Surgery*, vol. 57, Sept., 1942, pp. 414-28).
- ROBINSON, T. A. "Treatment of fractures of the shaft of the femur" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 140-3).
- WILKINSON, F. R. "Acute haematogenous osteomyelitis in children" (*Glasgow Medical Journal*, 1942).
- WILSON, G. E. "The management of the duodenum in gastric resection for duodenal ulcer" (*Surgery*, vol. 12, Sept., 1942, pp. 390-2).
- WOOKEY, H. "The surgical treatment of carcinoma of the pharynx and upper esophagus" (*Surgery, Gynaecology and Obstetrics*, vol. 75, Oct., 1942, pp. 499-506).

THERAPEUTICS

Under the direction of Professor R. F. Farquharson

Teaching has been carried on as in previous years. The department has assisted in various short postgraduate courses given by the Faculty of Medicine.

Drs. J. M. Meiners, J. Mackenzie, and A. J. Longmore were appointed as assistants in Therapeutics to teach the class that graduated in December, 1943, and Drs. A. J. Longmore and Allan Jousse for the class that graduates in July, 1943.

Dr. H. E. Pugsley was appointed as research fellow in Therapeutics.

In co-operation with the Departments of Medicine and other services of the Hospital, Dr. H. E. Pugsley has been investigating various aspects of the treatment of shock and the use of blood substitutes. It has been shown that the rate of flow of fluids administered intravenously is affected by the nature of the solution and its temperature, as well as by the size of the vein and amount of vasoconstriction. Thus saline solution and whole blood flow in more rapidly than does serum or plasma. The latter seems to give rise to increased constriction of the vein. The rate of flow of all solutions is increased by heating

the fluid flowing in the rubber tubing. Heating causes dilatation of the vein. The rate is greatly decreased by cooling the fluid, which causes constriction of the vein.

Sub-Department of Anaesthesia

Dr. Stanley Campbell of the Sub-Department of Anaesthesia has rejoined the department after two and a half years service overseas. Dr. K. L. Hollis has enlisted for active service.

In teaching students and training internes in Anaesthesia, emphasis has been placed on problems of Anaesthesia related to military service.

Clinical trials of new anaesthetics and new technical procedures in Anaesthesia, such as continuous caudal analgesia in labour, have been carried out.

Sub-Department of Physical Therapy

Miss R. Harland has acted as assistant in Physical Therapy.

PUBLICATION

WILKINS, R. H. "Anaesthesia in surgery of the oesophagus" (*Anaesthesiology*, April, 1943).

BANTING AND BEST DEPARTMENT OF MEDICAL RESEARCH

Under the direction of Professor C. H. Best

Aviation Medical Research

This aspect of the work in the department has been directed by Professor H. C. Bazett, who is on leave from the University of Pennsylvania. Dr. E. C. Black, who is Secretary of the Subcommittee on Oxygen Equipment of the Associate Committee on Aviation Medical Research, has collaborated with the R.C.A.F. officers in the development and production of oxygen equipment for the R.C.A.F. In addition, the Manual of Oxygen and Intercommunication Equipment has been written and published, and instruction has been given on this equipment to R.C.A.F. officers.

Much work has also been done in the field of protective clothing for the R.C.A.F. by members of the department, working in collaboration with the National Research Council Laboratories, the Ontario Research Foundation, and the R.C.A.F. Various new or improved articles of personal equipment have been produced for the R.C.A.F. and accepted. Those working on protective clothing in addition to Dr. Bazett are Dr. Burton, Dr. Pagé, Mr. Bentley, Mr. Macdougall, and Dr. Kitching. Dr. Kitching is Secretary of the Subcommittee on Protective Clothing, and he is assisted in this work by Dr. Pagé and Miss E. M. White.

Nutritional requirements at high altitude have been studied by Dr. Pagé. Mr. J. E. Goodwin and Dr. G. F. M. Smith, assisted by Miss Burgoyne and Mrs. Young, have continued the study of electroencephalographic records as a means of selection of aircrew trainees. Much fundamental work on problems of Aviation Medicine has also been carried out by Dr. Bazett.

Naval Medical Research

Surgeon Lieutenant E. A. Sellers has worked for some two months in collaboration with Lieutenant Neumann of the U.S.N. on problems of the peripheral circulation. They have utilized new methods for determining changes in volume of small blood vessels and have made a number of interesting observations. They found, for example, that when the blood vessels of the toes dilate as a result of a spinal anaesthetic there is a simultaneous, probably compensatory, constriction in the blood vessels of the fingers.

Dr. J. B. Bateman and Miss J. M. Lang have continued their work on the preparation of fresh water from salt. They have studied the Stedman Evaporator and a number of simple masks and condensers. Most of their work has been concentrated on the design of a hand-operated pump for freezing salt water and obtaining relatively fresh water from the ice. A model of a pump—the seventh one actually tested—has now been made available and it is hoped that this one will justify a sea trial.

Lieutenant C. Cowan played an important part in the designing of a new lifesaving jacket which, in addition to providing flotation and warmth, offers a considerable measure of protection against under-water blast. These new jackets are now being manufactured and it is hoped that by next summer some 30,000 men in the R.C.N. will be equipped with this new and improved jacket.

In collaboration with the R.C.A.F. Committee a lamp has been designed which can be seen for a far greater distance than any other lamp using the same power. The new model has, in addition, two or three times as long a life. These lamps are built into the lifesaving jacket and are comparatively waterproof. They will continue to function after long periods of immersion in water.

Lieutenant Cowan has been able to assist Surgeon Lieutenant Commander C. M. Oake in the construction of a proposed R.C.N. battle belt. He has also worked with Dr. Bateman on the fresh-water problem.

Mr. J. H. W. Willard and Surgeon Lieutenant Sellers continued their investigations on burn shock. They studied the rate of flow of lymph in burns and the toxicity of lymph from burned areas. They investigated the effect of plaster bandages on haemoconcentration and on the mortality from burns. They are now studying the effect of keeping the temperature of the burned area at a low level on the mortality rate and on the signs and symptoms of burn shock.

Sub-Lieutenant N. R. Stephenson attacked a number of problems. He has attempted to isolate a toxic factor from the burned skin of animals. These efforts have thus far been unsuccessful. He has helped improve the saline used with contact lenses. His main work during the last few months has been the design of a portable laboratory kit which has now been accepted for use in the Royal Canadian Navy. Supplied with this kit a medical officer will be able to do urine and stool analyses, haematology, blood grouping, and a considerable amount of bacteriological work. One hundred of these kits will be constructed in the R.C.N. Medical Research Unit and supplied to the Navy.

Surgeon Lieutenant W. Locke is testing the effect of various therapeutic agents in the treatment of shock. The condition is produced by the application of a pressure cuff around the leg. This procedure leads to changes in the composition of the blood and in blood pressure, which are characteristic of traumatic shock. Surgeon Lieutenant Locke is testing posterior pituitary extracts, adrenal cortical extracts, isinglass solutions, and various other materials. This work is being done in collaboration with Professor R. E. Haist of the Department of Physiology.

Surgeon Lieutenant J. M. Parker has been mainly responsible for the continuation of the work on swing sickness. The six swings at H.M.C.S. *York* have been used steadily and a great variety of therapeutic agents have been tested. It is possible to secure a combination which is better than any of those which have previously been available. It is hoped that a sea trial can be made in the near future.

Dr. A. E. MacDonald and Warrant Officer C. R. Shorney have been busy with the fitting of contact lenses. A group of army officers is now being equipped. The trials of the lenses in the R.C.N. have in general been satisfactory but further work is necessary.

General Researches (many of which are on problems of war medicine)

Dr. C. C. Lucas and his colleagues have been engaged on two main lines of investigation during the past year—penicillin production and nutritional studies.

The work on penicillin is being done in collaboration with Dr. P. H. Greey of the Department of Pathology and Bacteriology, under a grant from the National Research Council. The culture fluid containing the bacteriostatic agent is being produced in large quantity by Dr. Greey and is supplied to this department for extraction and purification of the penicillin.

Dr. S. F. MacDonald has constructed a pilot plant for the processing of large volumes of culture fluid from the mould *Penicillium notatum*. The procedure is essentially a counter-current continuous extraction at 0° C. About 10 litres per hour may be processed, the active principle being concentrated about two-hundredfold with a high percentage recovery.

Dr. MacDonald and Dr. Lucas are attempting to improve the purification procedures, seeking methods amenable to use in a plant producing large quantities of penicillin. Several promising leads have been encountered but possibly much work remains to be done before large quantities of clinically acceptable penicillin can be produced.

The quantity of penicillin produced by the mould is markedly altered by incorporating various chemicals into the modified Czapek-Dox medium used by the Oxford workers. Dr. Lucas and Dr. Greey have studied the effect of different concentrations of many substances which might exert a beneficial effect when added. The influence of such materials as heavy metals, vitamins, individual amino acids, sugars and starches, choline, glucosamine, urea, sulphonamides, glutathione, protein hydrolysates, yeast and soil extracts, corn steep liquor, etc., has been examined. Dr. Lucas, with the collaboration of Dr. J. M. R. Beveridge and the technical assistance of Miss M. O'Grady, has attempted to fractionate the more active extracts in an effort to identify the agent or agents responsible for increases in penicillin production. The fractions are tested by Dr. Greey.

The nutritional studies conducted by Dr. Beveridge and Dr. Lucas, with technical assistance from Miss O'Grady, have been concerned with the influence of choline on fatty livers. A comparison was made of the relative lipotropic efficacy of choline when ingested or injected (subcutaneously) at different dosage levels. Choline taken by mouth with the food is definitely more lipotropic. The same type of study was made using methionine. This amino acid is also more lipotropic when taken by mouth, the difference being more pronounced than in the case of choline. A study of the possible relationship of the essential fatty acids to the choline effect on fat metabolism or to choline metabolism itself, is at present being made.

Dr. J. H. Ridout has studied various aspects of the choline problem and has maintained her connection with the Canadian Dried Serum Project with which she has been associated since its inception in 1939.

Mr. C. S. McArthur (who has been supported in part by the Department of Pathological Chemistry) in collaboration with Dr. Beveridge, is studying the significance of the ratio of α to β phosphatides in the livers of rats on choline-rich and choline-deficient diets. Under the experimental conditions used, there appears to be a shift in the ratio in animals with fatty livers. In the normal rat liver, the lecithin is mainly in the α form (90 - 100 per cent), but in the fatty liver produced by dietary choline-deficiency for three weeks about 30 per cent appears in the β form.

Dr. MacDonald has prepared a series of intermediate compounds necessary for an attempted synthesis of bulbocapnine.

Dr. Lucas, and Dr. H. M. Macrae of the Department of Ophthalmology (now Captain, R.C.A.M.C.), have continued the special work being done under a grant from the Department of National Defence.

Dr. B. Mendel and his associates have continued their work on cholinesterase. Miss D. Mundell (Banting Research Foundation Fellow) improved the degree of purity of the pancreas cholinesterase, and Miss F. Strelitz further purified serum cholinesterase. Both preparations were used by Miss R. Durick

for an investigation of the actions of the enzyme in the animal body. Dr. Mendel and H. Rudney established the fact that two types of this enzyme exist, a specific or true cholinesterase and a non-specific or pseudo-cholinesterase. With Miss Mundell they devised methods for the quantitative estimation of both enzymes in blood and tissues. In Miss Durick's studies with Dr. Mendel, an attempt has been made to use purified cholinesterase to neutralize the effects of acetylcholine liberated in the body under physiological conditions. As a preliminary step it was found that the intravenous administration of purified pseudo-cholinesterase from dog pancreas or horse serum, prevented the excessive salivation and porphyrin excretion from the Harderian gland, which are produced by acetylcholine. Later it was discovered that administration of the enzyme is able to abolish, wholly or in part, the direct pupillary light reflex. This finding indicates that the integrity of the reflex depends on the presence of acetylcholine at some point or points in the pathway of the nerve impulse.

Dr. D. A. Irwin and Mr. D. C. O'Connell have continued the investigation of the vole acid-fast bacillus. The animal experiments begun last year to determine the effect of vaccination with suspensions of the vole organism on the resistance of animals to experimental tuberculous infection, were completed. A paper entitled "Vole Acid-Fast Bacillus Vaccination in Experimental Tuberculosis" covering the findings from these experiments is being published in the *Canadian Medical Association Journal*. The results of these experiments have shown sufficient promise to warrant a more detailed experimental investigation.

Heat-killed vole vaccines prepared in this department are now being tested on tuberculous patients in Ontario sanatoria. The co-operation of the provincial Department of Health and clinicians of the Ontario sanatoria in carrying out these tests, is appreciated. The financial assistance given to this study by the Ontario Mining Association is gratefully acknowledged.

PUBLICATIONS

- BEST, C. H. "Frederick Grant Banting" (Obituary Notices of Fellows of the Royal Society, vol. 4, 1942, pp. 21-6).
- "Reminiscences of the researches which led to the discovery of insulin" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 398-400).
- "The role of medical research in the improvement of the health and efficiency of civilian and military personnel" (*The Forum* (Victorian Order of Nurses), May, 1943, pp. 2-9).
- "Sir Frederick Grant Banting" (*Bulletin of the New York Academy of Medicine*, vol. 18, 1942, pp. 693-5).
- and LUCAS, C. C. "Choline—chemistry and significance as a dietary factor" (*Vitamins and Hormones*, vol. 1, 1943, pp. 1-58).
- and SOLANDT, D. Y. "Activities of the R.C.N. Medical Research Unit" (*Canadian Medical Association Journal*, vol. 48, 1943, pp. 96-9).
- IRWIN, D. "The contribution of Sir Frederick Banting to silicosis research" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 403-5).
- and O'CONNELL, D. C. "Vole acid-fast bacillus vaccination in experimental tuberculosis" (*Canadian Medical Association Journal*, vol. 48, 1943, pp. 486-8).
- LUCAS, C. C. "Chemical examination of Royal jelly" (*Canadian Medical Association Journal*, vol. 47, 1942, pp. 406-9).
- MCARTHUR, C. S. "The acetone-soluble lipid of the atheromatous aorta" (*Biochemical Journal*, vol. 36, 1942, pp. 559-70).
- PROCTOR, L. D., and GOODWIN, J. E. "Comparative electroencephalographic observations following electroshock therapy using raw 60 cycle alternating and unidirectional current" (*American Journal of Psychiatry*, vol. 99, 1942, pp. 525-30).
- SOLANDT, D. Y. and BEST, C. H. "The Royal Canadian Navy colour vision test lantern" (*Canadian Medical Association Journal*, vol. 48, 1943, pp. 18-21).

ART SERVICE

Under the direction of Miss Maria T. Wishart

The past year has been marked by constant hard work, which has followed along routine lines with very little of unusual interest.

An increasing difficulty to be contended with, is that members of the Faculty asking for work are so pushed for time these days, that they are unable to give us the work as long beforehand as we require, and seldom can find time to consider thoroughly the working out of their problems with us, a necessary step for the best results.

Miss Elizabeth Blackstock, an accredited etcher, who in the past has frequently acted as part-time assistant in the department, did so again this year, chiefly carrying on the work begun by Miss Swezey last year of making water colour records, for teaching purposes, of the early and middle stages of retinal arteriosclerosis. The development of the air brush technique and the general progress made in the assembling of the records were most satisfactory. These drawings form a nucleus of what might well become a valuable reference collection for teaching, that is, if opportunity and support permit of its expansion.

During some years, in addition to the routine work of the department, that is the making of illustrations and red-tapism (a necessary evil), there are many incidental interruptions. In taking a long view they are the natural outcome of the growth of the work and were they lacking it would be a reflection on the department. On the other hand, they are not an unmixed blessing for they take their toll of time urgently needed for creative work. Among such deviations were:

Dr. Edwin M. Robertson, Professor of Obstetrics and Gynaecology, Queen's University, Kingston, sought advice early in the year on how to approach the work of reproduction of pathological and clinical specimens in wax.

Only recently, a request in writing was received, asking for advice regarding the teaching and organization of the Department of Art as Applied to Medicine at Johns Hopkins Medical School. This request was made to Miss Wishart by the Dean of the School of Medicine, in the name of the committee appointed to review the situation.

In considering the latter instance it is interesting to reflect that the experience gained in undertaking to teach a pupil assistant Art as Applied to Medicine from the beginning proved valuable in a most unexpected way.

Illustrations from the Department have been used during this past year at the Interurban Orthopaedic Club in Toronto, the Orthopaedic Surgeons Meeting, Chicago, the Ontario County Medical Meeting, Oshawa, the Canadian Association of Clinical Surgeons, Toronto, the American Orthopaedic Association, Cleveland, and the Social Security Bill, Ottawa. They have been published or are about to be published in *Surgery, Gynaecology and Obstetrics*, the *American Journal of Anatomy*, *Annals of Surgery*, a text-book for nurses, *Materia Medica*, *Boyd's Text-book of Pathology*, 4th edition, the *Journal of Bone and Joint Surgery*, *International Clinics*, the *Canadian Medical Journal*, *Surgical Clinics of North America*, etc.

SUMMARY OF WORK OF ART SERVICE

I. *According to Medium of Work*

1. Water colour.....	30
2. Pen and ink.....	55
3. Half-tone.....	4
4. Wax models.....	3
5. Pencil sketches.....	3
6. Black and white.....	4
7. Wash.....	1
Total.....	100

II. *According to Departments*

1. Medicine.....	14
2. Medical Research.....	11
3. Neuropathology.....	1
4. Neurosurgery.....	5
5. Obstetrics and Gynaecology.....	1
6. Ophthalmology.....	8
7. Pharmacology.....	6
8. Surgery.....	54
Total.....	100

III. *Number of Members of Faculty for Whom Work Was Done.....* 14

MEDICAL SOCIETY

May, 1942, to December, 1942

<i>Honorary President.....</i>	Dean W. E. Gallie
<i>President.....</i>	R. G. Bell
<i>Vice-President.....</i>	G. Culman
<i>Treasurer.....</i>	S. C. Robinson
<i>Assistant Secretary-Treasurer.....</i>	R. C. Crompton

The Medical Society Executive was elected in the spring term of 1942 to direct the programme of student activity until Christmas. Formerly the elections were on an annual basis but because of the speeded-up war-time course, it has been necessary to hold elections that correspond with the academic year. In spite of the shortened term of office, some great advances were made under Gordon Bell's capable chairmanship.

One of the most notable features was the inauguration of the Arts and Letters Club. This club provides extra-curricular entertainment for the students of Medicine and also for many School and Arts men. It was originally proposed to have various Philosophy, Revolver, Music, Camera, and other clubs, but the only club which persisted to function actively was the Arts and Letters Club. It is hoped, however, to have all the above-mentioned clubs playing an active part in student activity in Medicine in peace-time. Under the direction of Gordon Millar, the Arts and Letters Club entertained more than 900 people until the Christmas vacation.

There was no Medical Banquet this year, mainly due to war-time restrictions and difficulty in making suitable arrangements. It was replaced in October with a Soph-Frosh banquet handled by Alex McIntyre and his Soph-Frosh Committee. The guests of honour and speakers for the evening were President Cody, Dean Gallie, and Judge Mott. The Soph-Frosh Committee also carried out the initiation of first year into the Faculty of Medicine and 150 eager freshmen were raked over the coals by a zealous throng of sophomores.

George Culnan was chairman of the informal Meds at Home held in November. Morgan Thomas and his orchestra entertained and the dance was a success in every way.

The Canadian Association of Medical Students and Internes, started on this campus in 1938, took part in the extensive "Student-Staff" conference in December. This meeting was primarily to allow the students to express their opinions on the various changes necessitated by a war-torn world and was very successful in producing a finer co-ordination between students and staff of the University.

The *Medical Journal* was edited by Gordon Stewart and presented two issues. This number was, of course, only from August until December. Four more issues are to be presented by the new editorial staff.

George Culnan, who was Vice-President, has been acclaimed as the President of the Medical Society for next year and in his capable hands the Medical Society is assured of an active session.

J. A. MCINTYRE

January, 1943, to July, 1943

<i>Honorary President</i>	Dean W. E. Gallie
<i>President</i>	G. Culnan
<i>Vice-President</i>	H. J. M. Barnett
<i>Treasurer</i>	E. J. Wilford
<i>Assistant Secretary-Treasurer</i>	J. A. McIntyre

The new Medical Society Executive elections were held late in November at Hart House, following the custom of the last few years, but the attendance was not representative of the students. George Culnan was acclaimed President of the Medical Society for the session from January, 1943, to July, 1943.

The first function of the new society was the annual Soph-Frosh dance under the direction of Alex McIntyre. It had been postponed until January as the "Meds" at Home was held in the fall. Approximately 120 freshmen attended and since the main purpose of the dance is to help introduce the first-year men, it was judged to be a success.

The second Medical at Home for the academic session was held in February. Music was supplied by Mart Kenney and his Western Gentlemen and the dance was thoroughly enjoyed by all who attended. However, the response of the students was disappointing and Henry Barnett and his committee were left with a deficit to turn over to the Medical Society.

Under the editorship of Eric Routley the *Medical Journal* produced four issues from January till May—a very creditable performance for the students under the rushed curriculum. This completes the six issues promised by the *Journal* Staff for the period from September, 1942, till September, 1943.

In April the Medical Society was faced with a severe financial crisis. The Medical Society fees were being paid each fiscal year rather than each academic year. The Society, however, was carrying on activities through one academic year and nearly half another, during each fiscal year. Under the standing financial arrangements there seemed no way to prevent the Society from sinking deeper and deeper into debt. It was therefore proposed to present the problem to the students and suggest a solution in that the students should pay the Medical Society fee each academic year rather than annually. The students responded whole-heartedly to this suggestion, but at the time of writing it remains to be seen if the University will allow them to pay this extra fee through the Bursar's office or whether the Society will be forced to adopt some other means to assure its continuance.

To help clear its outstanding debts the executive held a party at Casa Loma with the music supplied by the Modernaires. The party was an outstanding success from every standpoint, and showed the student feeling to be with the Society in its hour of need.

In April the Medical Society elections were held for offices to be held from June, 1943, till March, 1944. Henry Barnett was elected the new President and under his able directorship the Medical Society is assured of a bright future.

J. A. MCINTYRE

MEDICAL ATHLETIC ASSOCIATION

May, 1942, to December, 1942

<i>Honorary President</i>	Dr. J. Hepburn
<i>President</i>	D. W. S. Best
<i>Vice-President</i>	J. A. Turner
<i>Secretary-Treasurer</i>	R. J. Delaney

The executive took office in the face of a two and a half month spring term with no intramural activities and no other Faculty in attendance at the university. To let those months slip by without some form of organized and all-

embracing activity would have been nothing short of a catastrophe. Although it had often been said that all activities must be subservient to the war effort, it was the opinion of the executive that the standard of work, already high, and the long hours of the lengthened term could best be maintained by definite periodic relaxation and enjoyment,—and by what better means than through sport? With this in mind, a 19-team spring baseball league was organized to include nearly 200 students. To ensure entry of a maximum number of teams and to equalize as nearly as possible the strength of each, a team was to consist of the members of one clinic, i.e., clinic teams. To examine the effectiveness of this plan, one has merely to note the repetition and expansion the following spring of a 26-team league and the enthusiasms of all participants.

That there was a certain lack of interest in sports seemed to be a fabrication in the minds of a limited number and was proven fallacious both in the spring and in the subsequent fall terms. The enthusiasms experienced in baseball strengthened the conviction of the executive, and plans were made for increased participation in intramural activities. Track was promoted by holding a track meet late in September which included more than 150 male and female contestants.

A successful golf tournament was also run off early in September. The number of teams entered in the major intramural sports was the same as previous years while in minor sports such as volleyball, etc., the number of teams was quadrupled. Such teams were chosen from years and were called year teams. That the quality had not deteriorated by any means was evident by the fact that five of "Meds" volleyball teams won their respective groups and by the fact that with the close of the fall term, "Meds" stood third in the T. A. Reed trophy competition.

Finally, to decrease the expenses, the previous policy of giving sweaters to all participants was revoked, and a more adequate method of looking after all equipment was instituted.

R. J. DELANEY

January, 1943, to July, 1943

<i>Honorary President</i>	Dr. E. F. J. Brooks
<i>President</i>	T. A. B. Boyd
<i>Vice-President</i>	R. J. Delaney
<i>Secretary-Treasurer</i>	G. A. Lewis
<i>Second-year representative</i>	J. W. Fielding
<i>Quartermasters</i>	J. F. Murray J. S. Spooner

The executive came into office at a time when the financial status of the Association was at low tide, and was rather dismayed to find that no new assessment was due from the student body to reimburse the treasury. In the face of this financial emergency, the executive tightened its belt by every means possible but found itself obliged to incur a debt which the U. of T. Athletic Association agreed to carry until such time as the M.A.A. was in a position to repay it.

The interest and enthusiasm for competitive sports among the students of the Faculty of Medicine have attained new heights since the acceleration of the academic course. This year "Meds" gave "School" a thrilling race for the T. A. Reed trophy finishing up finally in second place only after a gallant struggle.

After the other Faculties had closed for the year, there still remained a long spring session for the Faculty of Medicine. During the interim between winter and spring seasons, two squash tournaments were held in which approximately 50 students participated. As soon as good weather permitted, an outdoor baseball league, consisting of 26 teams, was drawn up, and a total of 70 games were

played on the back campus, west of Hart House. These spring sports alone provided recreation and enjoyment for about 250 medical students. The baseball season was completed by June 14 to give the students time to settle into the final drive for examinations.

Due to the curtailed finances, no special medals were given for competitive accomplishment in sports. The traditional and much honoured Medical Athletic Stick, however, was again donated, this year to our popular and hard-working president, Art. Boyd, who contributed invaluable not only by athletic example but also in organizing and managing the affairs of the Medical Athletic Association.

While speaking of special honours bestowed on our medical brothers for athletic prowess, it should be mentioned here that Jim Murray was this year winner of the Biggs trophy presented by Mrs. George Biggs in memory of her husband, Medicine, '05, to the undergraduate of the University of Toronto contributing most to athletics by way of leadership, sportsmanship, and performance. Jim has been Quartermaster of this executive as well as a member of the U. of T. Athletic Directorate during the past year and deserves congratulations for his splendid record.

It is the firm opinion of the executive that the development of a sound, healthy body is of prime importance in these days, and the enthusiastic response of the students during the past year reflects vividly their whole-hearted agreement.

GEORGE A. LEWIS

MEDICAL WOMEN'S UNDERGRADUATE ASSOCIATION

<i>Honorary President</i>	Dr. E. Stewart
<i>President</i>	Beth Harrison
<i>Vice-President</i>	Jean Farquharson
<i>Treasurer</i>	Mrs. H. E. Banting
<i>Secretary</i>	Dorcas Beaton
<i>First year representative</i>	Helen Wasman

This executive was in office from December, 1942, until July, 1943, and participated in a number of social events.

A tea dance was held in the common room of the Medical Building in February to raise money for war purposes, and another tea dance was organized before the medical elections in March, by the girls of the preclinical years.

The church service usually given to the graduating class was curtailed, but in June a tea was given in their honour at the Royal Alexandra Palace. Gifts were given to the girls of the graduating year. The guest speakers, Dr. Sue Adams of the C.W.A.C., and Dr. Frances Stewart of the R.C.A.F., told of their experiences in the armed forces and the part played by women doctors in the war effort. The tea was very well attended.

